

# When the Levee Breaks

A Rallying Cry to Modernize Card Technology

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Chapter 1

# Building a case for next-gen card technology

# Building a case for next-gen card technology

Most organizations, including banks, believe that digital transformation is essential to enhance agility, competitiveness, and efficiency. Yet, the path to it is anything but simple. As George Westerman from MIT Sloan says, somewhat tongue-in-cheek, “When digital transformation is done right, it’s like a caterpillar turning into a butterfly. But when done wrong, all you have is a really fast caterpillar”<sup>2</sup>. Today, there is a growing view that digital transformation is not a specific end-state but a continuous journey representing a shift in mindset and operating paradigms.

In banking, the scope of digital transformation touches many facets. A particularly thorny one is the replacement of legacy core banking and payment processing systems at the heart of most financial institutions. Until recently, there weren’t any viable alternatives for modernization, making core replacement a high-stakes decision.

In July 2022, McKinsey issued a rallying cry for bank modernization in its report titled ‘Should US banks be moving to next-generation core banking platforms?’<sup>3</sup> The Aite-Novarica Group<sup>4</sup> estimates that revenue at risk for retail banks that do not focus on modernization could be 10% to 15% of retail bank payments revenue annually, or \$100 billion to \$150 billion globally. Payment processing, in particular issuer processing technology,

which controls the success of a bank’s card programs, has received somewhat lesser attention.

As a provider of next-gen issuer processing solutions across 8 countries for over 7 years, Zeta has been at the frontlines engaging with banks, consultants, and other experts in the domain. Our privileged conversations give us unique insights into the corrosive impact of legacy processing systems and the challenges banks face in making a viable case for the modernization of their card technology. Our experience with building and deploying next-gen processing systems to support card issuers globally, allows us to present successful strategies for the same.

This white paper integrates perspectives from domain experts and conversations with scores of banking leaders to help answer **three** important questions:

1. What is Next-Gen Processing (NGP), and how is it different from Legacy Processing?
2. How can banks derive real and tangible value from NGP?
3. What does the processing stack of the future look like?

*“With fast ideas comes faster innovation: 60% of Apple’s revenue comes from products that didn’t exist 4 years ago. That’s a blistering pace of innovation. Expect that to become the norm in most industries as the future accelerates, product life cycles collapse, and disruption disrupts.”<sup>1</sup>*

— Jim Carroll, Futurist

Chapter 2

# What is Next-Gen Processing?

# What is Next-Gen Processing?

The premise of next-generation processing is straightforward. It allows banks to transform into truly digital-native organizations that build stronger relationships with their customers and enhance revenue while significantly reducing their IT and operational costs in the process.

However, these benefits are achieved over time and require real commitment. Compared to legacy processing systems, which were deployed when

cloud, mobiles, or even the internet did not exist, next-generation technology is inherently connected, scalable, and composable. Leveraging its benefits requires an overhaul of the operations model, thus going beyond a routine systems upgrade. This makes a shift to next-gen processing stacks challenging but definitely possible to execute.

Table 1 identifies **10 key dimensions** that differentiate a next-gen processing stack from most banks' typical

state of affairs today. It highlights how a next-gen processing system overcomes shortcomings of legacy systems across several dimensions including, architecture, resilience, scalability, configurability, and more.

The following section demonstrates how next-gen processing creates measurable value and why a move to such a system is important.

Table 1: Legacy Processing vs. Next-Gen Processing

	Legacy Processing (Current State)	Next-Gen Processing (Desired State)
<b>Architecture</b>	Monolithic architecture with legacy commercial components, complex and expensive upgrade and downgrade cycles, hard-coded object models, poor API coverage, typically as wrap-arounds over legacy core	Microservices mesh format with event-driven architecture, headless and API-first, extensible object models, built with modern software languages and paradigms (Java, Python), enabling continuous feature releases via modern CI/CD
<b>Infrastructure</b>	On-premise systems using legacy hardware e.g., mainframes and/or basic lift-and-shift to the cloud, cost-intensive and inflexible in scale	Cloud-native with near-infinite scalability

	Legacy Processing (Current State)	Next-Gen Processing (Desired State)
<b>Unified Solution</b>	Multiple disconnected systems to deliver each product - credit, debit, prepaid, DDA, checking, deposits, etc; limited visibility and understanding of a customer's aggregate relationship with the bank	Ability to compose all asset and liability products on a single technology platform, enabling scope and scale efficiencies; unified 360-degree view of a customer's relationship with the bank
<b>Configurability</b>	Legacy green-screen UI requiring code changes and lengthy release cycles for platform configuration, reducing launch speed/customizability	Leverage web-based interfaces and modern intuitive UX for real-time changes via configuration and not code, largely using GitOps semantics
<b>Integrations</b>	Poor integrability with external systems, modern or legacy; complex and brittle integrations built around the core	Extreme integrability using APIs, events, webhooks, interceptors; easy integration with best-in-breed modern banking systems for CRMs, Servicing, Channel Management, etc.
<b>Transaction Processing</b>	End-of-day batch processes with poor scalability, downtimes, and frequent maintenance	Real-time transaction processing and settlement with almost no downtime
<b>Data Models</b>	Rigid data models with no ability to model new use cases (e.g., a card = an account = a customer)	Modern data architecture with normalized schema and flexible data models supporting one-to-many, many-to-many, and many-to-one relationships between entities
<b>Analytics</b>	Poor access to and ability to surface a bank's proprietary data to build new products, strengthen customer relationships, and improve point-of-sale outcomes	Rich and multi-modal access to data in real-time to improve decision making, embed contextual nudges in customer journeys, and build segmented offerings
<b>Personalization</b>	One product construct for all customers; Limited personalization restricted to APR and rewards	True 'segment-of-one' product construction using hyper-personalized pricing (fee and interest) at program, customer, account or transaction level
<b>Distribution</b>	No awareness or understanding of distribution models for financial products; digital distribution / embedded banking is out of scope	Embedded banking aware stacks allow building distribution ecosystems via agent banks, fintechs, and co-brands

## Chapter 3

# How does Next-Gen Processing create value?



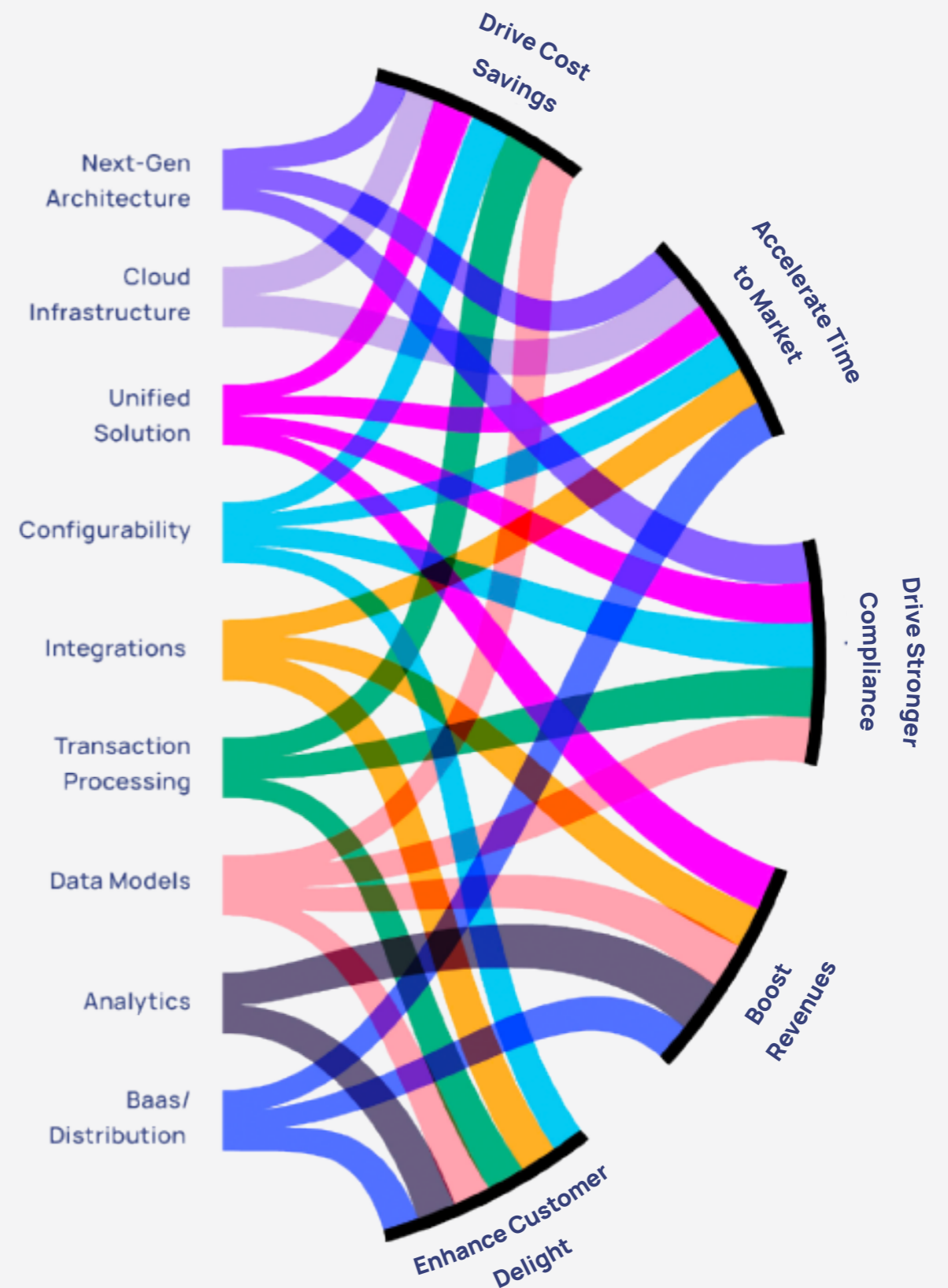
# How does Next-Gen Processing create value?

Conversations about Next-Gen Processing need to go beyond leveraging the cloud or using new technology. Fundamentally, it's about changing the way a bank runs its cards business, reimagines business models, and launches products for the future.

Most boards wrestle with prioritizing such a significant shift over other operational considerations. Apart from the challenge of proving the urgency of such a move, the risk of disrupting traditional processing workflows must be measured, quantified, and evaluated against possible benefits. But, as banks engage with the reality of their aging systems, the imperative for moving to next-gen processing platforms is only getting stronger.

As with any complex transformation initiative, the realization of value is highly dependent on a significant number of variables and business drivers specific to each bank. To aid in this tabulation of value, we provide a framework with **5 value-creation levers**, each demonstrably driven by next-gen processing dimensions.

Next-Gen Processing Value Creation Framework



# I. Drive cost savings

According to the 2023 McKinsey Global Payments report, modernization of banks' technology stacks can reduce operating costs by **20% - 30%**<sup>6</sup>. That's a staggering number. How is this achieved?



## Higher productivity

Over **50%**<sup>7</sup> of a bank's IT spend is typically spent on people (insourced + outsourced), primarily because of the challenges around hiring and training people who know legacy systems. Therefore, a significant lever for realizing cost savings is improved productivity. A next-gen processing stack drives productivity gains by enabling:

- **Modern software development** paradigms like DevOps and CI/CD release management enabling increased capacity creation by **25% - 30%**<sup>8</sup>.
- **Simplified self-service capabilities** that enable no-code or low-code approaches to configuring and managing IT projects, offering opportunities to reduce resource costs



## Lower technical debt

In bank after bank, keep-the-lights-on expenses on legacy systems consume large parts of IT spend and starve innovation projects of bandwidth. According to McKinsey, one mid-sized bank spent **two-thirds** of its digitization budget on this alone<sup>9</sup>.

However, another McKinsey report found that operating costs of fintech banks powered by next-gen core platforms are around **10 percent** of the operating costs of traditional banks<sup>10</sup>. Even adjusting for the higher complexity of a bank v/s a non-bank, the cost differential is stark.

Retiring legacy tech debt is not a simple process. But with modern technology, banks can invest significantly more in revenue-generating projects, yielding a virtuous cycle.



## Increased automation

Automation, especially Robotic Process Automation (RPA), is a staple of most banks' cost savings programs. Today, with Artificial Intelligence (AI) and Machine Learning-led applications like chatbots and generative AI, the possibilities continue to grow.

*Barclays introduced RPA across a range of processes, such as accounts receivable and fraudulent account closure, reducing its bad debt provisions by approximately **\$225 million per annum** and saving over **120 FTEs**<sup>11</sup>.*

However, to achieve meaningful automation outcomes, banks need processing stacks designed to access customer data and their IT systems using a variety of modern access methods such as **events, data marts, APIs**, and more.

## II. Accelerate time-to-market

Geoffrey Moore's book 'Zone To Win' prescribes segmenting projects within a business ecosystem into **four zones - Transformation, Incubation, Productivity, and Performance** - with a distinct playbook to enable success in each<sup>12</sup>. The key call-out is that different goals - such as velocity and accelerated innovation - require different types of approaches.

In the 2023 Global Payments Report, McKinsey observes that modernization of banks' technology stacks **halves the time to market** for new products<sup>13</sup>.

We now describe the elements that drive this acceleration.



### Faster product conceptualization

Creation requires iteration, and iteration requires velocity. And velocity is intrinsically tied to modern technology. Research finds that a lightweight processor platform can enable an organization to advance new products from concept to launch in **two to three** months<sup>14</sup>. At scale, the results are truly transformational.

A large global neobank unencumbered with legacy and serving 200 million+ retail customers and 1.3 million+ small and medium businesses, releases 1,000+ app updates a month, and takes **~10 days to launch products** from ideation to deployment<sup>15</sup>.



### Owned product roadmap

Modern software development enables speed in various ways - but requires ownership of the product roadmap, which is a far cry from what is offered by legacy processors.

From accessing the plentiful engineering talent for modern programming languages such as Java and Python to adopting continuous integration and continuous delivery of software with multiple releases each day, modern engineering practices have many benefits.

Table 2: Benefits of modern engineering practices

Then		Now
<b>COBOL</b>	Modern programming languages with large pools of resources and faster development	<b>Java, Python, Javascript, JSON</b>
<b>Green Screens</b>	Rich, web-based interfaces for each bank persona - product, IT, risk, business	<b>Modern Web-based Panels</b>
<b>Hardcoded</b>	Most actions achieved via configuration files without writing any code	<b>Config-as-Code</b>
<b>Monolithic applications</b>	Rapid deployments with no downtimes using a microservice mesh	<b>Loosely Coupled Microservices</b>
<b>Custom Code</b>	Create, Read, Update, and Delete (CRUD) actions enabled via APIs, webhooks, events, v/s custom code	<b>APIs, Webhooks, Events, ...</b>



## Faster integrations with external surround systems

The ability to rapidly integrate the bank's core processing platform with external surround systems like CRMs, Rewards Catalogs, Lifecycle Marketing, Credit Decisioning, Fraud Management, or AML/BSA is critical to building a winning payments product experience today.

Two next-gen processing capabilities can enable these integrations in weeks v/s years, significantly accelerating time-to-market:

- **Modern integration** mechanics use APIs, webhooks, event streams, interceptors, and data marts to allow data and actions to flow across multiple systems - in real-time or near-real time.
- **Extensible data models** can be enriched with additional attributes, tags, and rich media (such as text, images, video), thus allowing multiple external systems to be loosely coupled with a consistent definition across each system.



## III. Enhance customer delight

McKinsey research<sup>16</sup> shows that banks designated as 'Customer Experience (CX) leaders' generate **72%** more total shareholder return than 'Customer Experience (CX) laggards'. And perhaps more tellingly, 'satisfied customers are **six times** more likely to say they will remain with a bank than dissatisfied customers'<sup>17</sup>.

While there are many aspects to drive customer delight, the following two are especially significant.



### Hyper-personalization aka Segments of One

The benefits of hyper-personalization in driving greater business value are well understood, especially amongst large consumer/retail oriented businesses.

The offer redemptions at Starbucks increased three-fold with personalization, with an estimated 25% transactions being done on the mobile app. The hyper-personalized product recommendation engine at Amazon generates over 35% conversion, and 80% of Netflix customers follow through on its recommendations<sup>18</sup>.

A compelling and truly bespoke payment experience requires the ability to parameterize and build unique product outcomes **for every single customer and transaction** in real time and at scale. Essentially, issuers need to control the user experience across three unique dimensions:

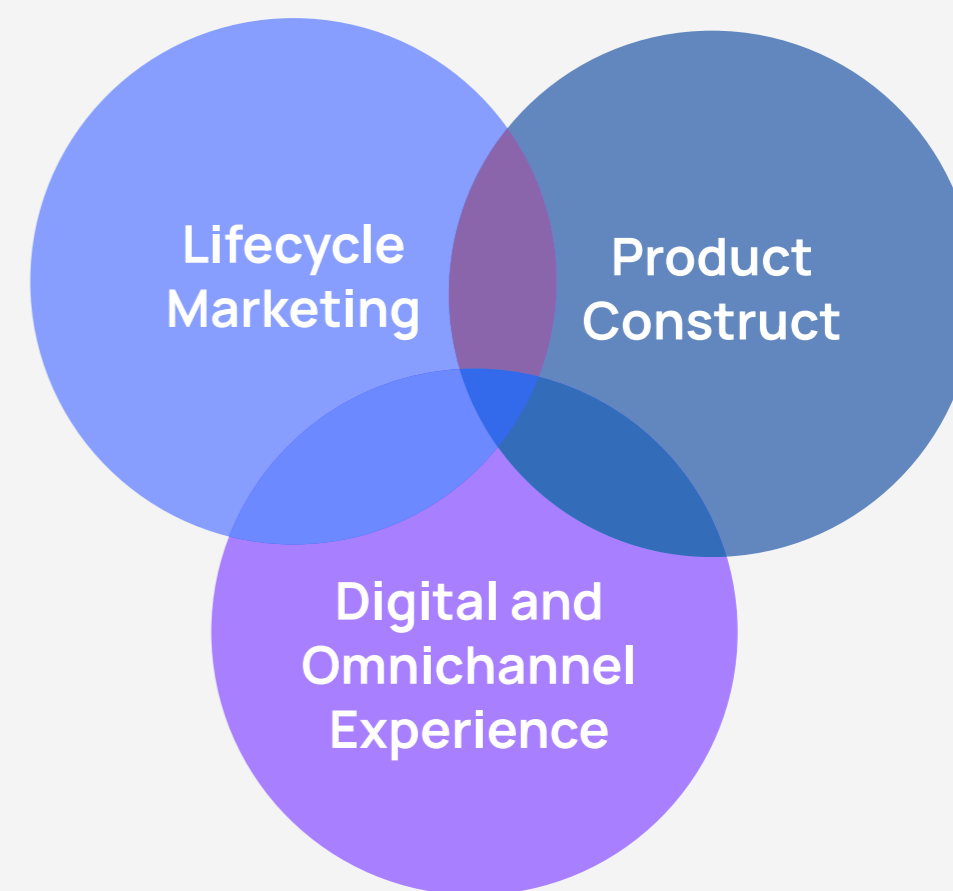
1) lifecycle marketing, 2) digital and omni-channel

experiences, and 3) the actual product construct. While many banks are somewhere along the curve in achieving the first two, the third is nearly impossible without next-gen technology.

Next-gen processing enables unprecedented control and creativity in crafting product behavior through:

- Dynamic Programs and Policy selection based on real time events
- Micro-adjustment APIs for every attribute of a Transaction, Card, Account and Customer
- Runtime Inversion of Control through inline dynamic low-code execution
- Co-operative Authorization through configurable Interception of Auth flow

Drivers of customer delight





## Integrated and seamless omnichannel journeys

Another significant lever for customer satisfaction is a robust omnichannel strategy that allows banks to create integrated and seamless journeys across touchpoints like Mobile App, Web, Call Center, IVR, Chatbots, Email, and SMS.

Omnichannel customer journeys that include seamless integration with partner ecosystems (e.g., CRM or notification platforms) require a data platform capable of ingesting, analyzing, and deploying vast amounts of data in near real-time<sup>19</sup>. Therefore, investing in a next-gen platform that provides each channel with a consistent way to access data is essential for success.

Table 3: How next-gen platforms enable omnichannel journeys

<b>APIs</b>	Application Programming Interfaces - provide ability for external systems to easily connect with the processing platform to pull or push data or actions
<b>Event Streams</b>	Access to live events - such as card usage or payment failures - provide ability to inform or communicate with customers in real-time
<b>Interceptors</b>	Interceptors provide a way to stop a flow to consult external systems - such as an authorization provider - and keep the system 'paused' until a response is returned
<b>Data Marts</b>	Rich and consistent access to customer data via data marts allows customization and consolidated views to improve omnichannel journeys

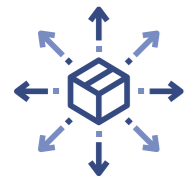
*“Financial institutions struggle to offer a next generation banking experience with legacy platforms. As new competitors launch more sophisticated banking products and experiences, they will attract both old and young consumers away from traditional financial institutions who cannot respond quickly enough to evolving expectations. Additionally, new changes like AI require agility and access to real-time data, which can be challenging to provide with legacy systems.”*

*— David B. Shipper  
Director, Retail Banking and Payments, Datas Insights*



## IV. Boost revenues

Next-gen processing systems drive growth in revenue for banks by helping them target newer customer segments, open new revenue lines, and enhance wallet share with existing customers.



### Seamless distribution

Banks need a vibrant ecosystem of partnerships to increase reach and scale, including distribution relationships with co-brands, fintechs, or agent banks. The proposed Section 1033 regulation, if passed, will add another layer of legally enforceable requirements on the collection, use and sharing of customer data.

Current architectures lack the connectivity to third parties that can drive innovation<sup>20</sup>. Next-gen processing platforms enable this by providing:

- various integration mechanisms to support such connections (refer to Integration and Distribution in Table 1),
- build capability for partner-aware data models, and
- sandboxed access for different groups of partners



### New-age digital experiences

Seamless digital experiences are not a nice-to-have but how consumers want to engage with their banking and financial products today. Non-banks touch **4 out of 10** banking customers in the US<sup>21</sup> by offering better customer experience, easy access, and more features. And these new players are here to stay. Consider that in spite of the flight to safety of deposits in 2023, SoFi and Varo Bank each recorded **37%** and **43%** quarterly deposit growth, respectively<sup>22</sup>.

Digital customer experiences thus represent the tip of the spear in terms of the outcomes most banks want to achieve with their digital transformation initiatives: more revenues and reduced costs.

Table 4: How digital experiences drive revenues and costs

Digital Experiences	Revenue Drivers		Cost Drivers	
	Higher Spends and Balances	Improved Retention	Lower Support Costs	Lower Fraud Costs
Instant Issuance	✓	✓	✓	
Family Hub experience for Cards	✓	✓		
Personal Virtual Cards with Rules	✓	✓		
Enhanced Card Security	✓			✓
Powerful Card Controls			✓	✓
Enriched Transactions		✓	✓	
Contextual & Integrated BNPL	✓			



## Improved segmentation

Undifferentiated and serve-everyone models do not necessarily result in value creation through economies of scale. Now more than ever, it is possible for distribution and product development models to serve discrete segments easily if enabled by the right technology.

Consider for example, that the head of the average US household generates on average **\$2,700** in banking revenues against a digitally native, aged 35-55, New York city-based counterpart who generates **\$13,500**<sup>23</sup>. Non-banks have built very effective value propositions for different segments of age, demographics, and other descriptors. Banks must follow suit.

A next-gen processing platform provides a number of capabilities, like rich data, personalization capabilities, customizability, product management tools, etc., that can be leveraged to discover and drive product sales across different segments.



## Improved upsell, cross-sell, usage, retention, and top-of-wallet

A typical regional bank in the US has over **1500** customer journeys spanning business units and product lines<sup>24</sup>. Across many of these journeys lie opportunities to upsell, cross-sell, engage, retain, and influence top-of-wallet behavior.

These outcomes are achieved through improved digital experiences, targeted offers, contextual nudges, and other interventions. These interventions are themselves enabled by access to data and insights and the ability to customize experiences - a cornerstone of next-gen platforms. Success is measurable and visible, as was the case with a private label credit card issuer that increased new card sign-ups by **29%** using various data-driven optimization strategies<sup>25</sup>.

## The final frontier: AI-driven ROA optimization with Next-Gen Processing

Today, banks are already in the age of AI-assisted decision making, especially in underwriting and fraud mitigation. In the next few years, experts estimate a shift to AI-driven decision making, where AI models will not assist but make decisions independently.

With sophisticated Deep Learning models, AI-driven decision making can deliver unprecedented optimization of Return on Assets (ROA) by fine tuning income (e.g., fee revenue, interchange) and expenses (e.g., cost of funds, fraud losses) at a customer, account, and even transaction level.

Next-gen platforms deliver the three building blocks necessary to make this AI-powered future a reality for banks:

- An Open Data stack with a structured data lake suitable for training sophisticated AI models
- Micro Adjustment APIs so the AI model can experiment and implement decisions on a per-customer or per-account basis
- Real-Time Events so the model can get real-time feedback to learn and adapt continuously



## V. Drive stronger compliance

In recent years financial institutions have been particularly impacted by rising compliance costs. The Baker Institute for Public Policy at Rice University revealed that, collectively, non-interest expenses for U.S. banks have surged by an average of over **\$50 billion**<sup>26</sup> annually since the enactment of the Dodd-Frank Act. Another Deloitte study comparing compliance expenditures to levels before the 2008 financial crisis, estimates that banks' costs have risen by more than **60%**<sup>27</sup>.

Regulatory compliance mandates are non-negotiable, but banks and issuers can use next-gen processing to build stronger programs that not only guarantee compliance but do so efficiently and at lower cost.



### Automated and always-on compliance

Most compliance management frameworks today rely on post-facto audits, manual interventions, and little to no automation in response to compliance or risk norms. This approach makes the risk and compliance processes at the banks inherently error-prone, non-scalable, and brittle. For example, the introduction of a new regulation on data collection would require a considerable amount of coding to ensure that all relevant fields were indeed being captured correctly at the point of entry - and may take months to implement.

The architecture of next-gen systems enables banks to have an 'always-on' posture on compliance, achieved by:

- Introducing multiple and proactive lines of defense for every change introduced in the system across any program parameter or definition: makers and checkers, controllers, and auditors
- Introducing the notion that any change to a program construct that is non-compliant is rejected and never allowed into the system using config-as-a-code semantics
- Ensuring that any change to a program construct, however small or large, triggers an automated set of previously defined compliance test cases that must be validated before that change can move forward into production
- Rapidly extending the data model that pertains to customers, accounts, cards, transactions, etc., to allow the introduction of new fields to track additional parameters in response to new compliance mandates, for example, tracking and reporting additional data related to small businesses following the introduction of CFPB 1071<sup>28</sup>



## Chapter 4

**What does the  
processing stack of the  
future look like?**

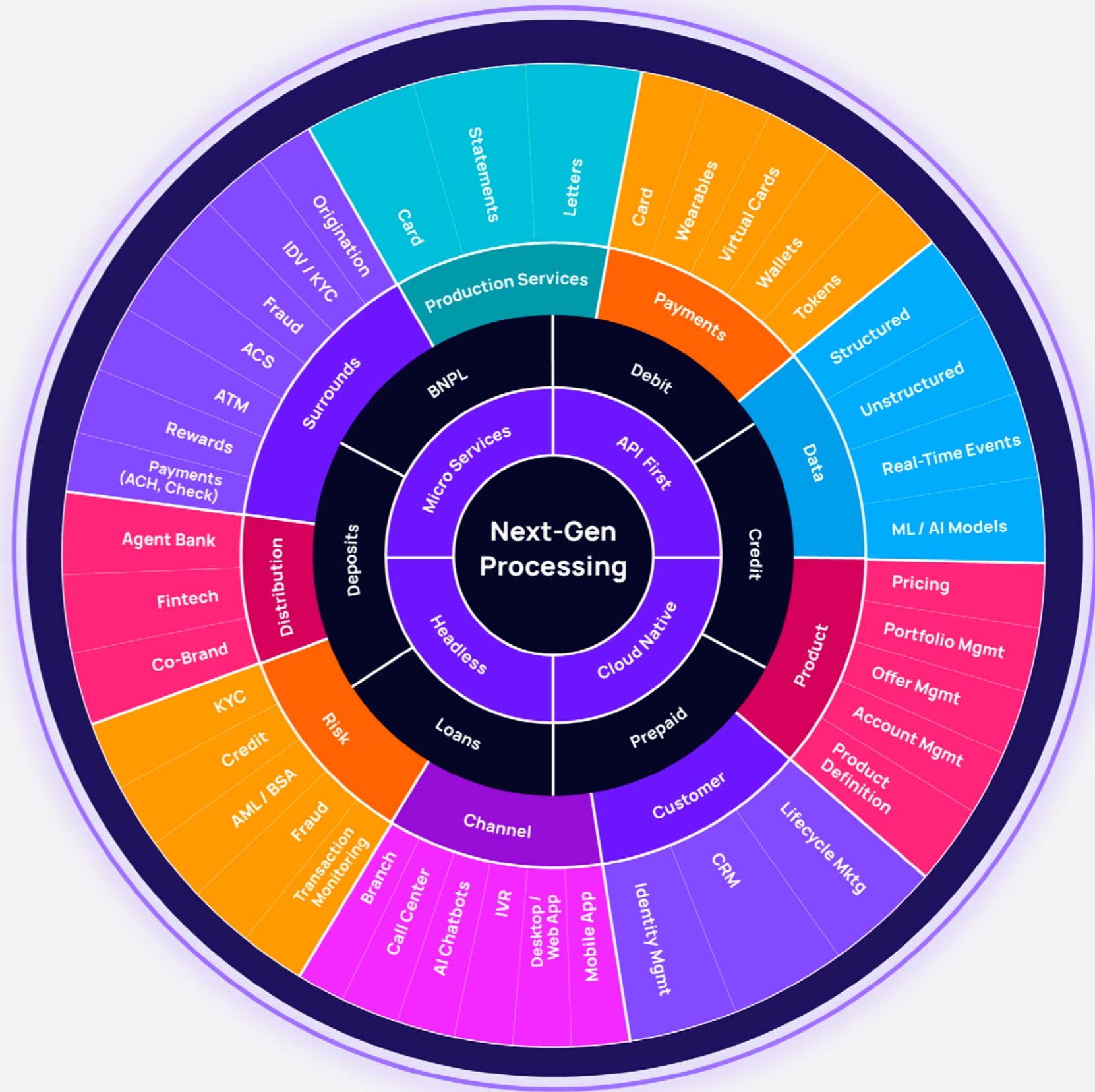
# What does the processing stack of the future look like?

Innovation is crucial for long-term success in banking, but realizing its benefits is not easy. Banks face challenges due to slow economic benefits, with new ideas taking three to five years to show results. Regulatory demands often prioritize immediate concerns over long-term growth. There's also a clash between a risk-averse culture and the reality that not all innovations succeed.

The success of a Next-Gen Processing platform must be measured by its ability to significantly accelerate the transformation journey for banks as they become more digitally-native, and deliver tangible and meaningful value.

In the previous section, we provided a detailed framework for tabulating the value creation possible with next-gen processing across multiple dimensions. In implementation, every bank will typically have its own specific formulation of the next-gen processing stack. However, any state-of-the-art stack will incorporate and integrate many of the structural elements illustrated here, with an eventual goal of future-proofing of the bank's payments platform and resulting business lines.

Next-Gen Processing stack and supporting ecosystem



Structurally, such a stack will be powered by a Microservices, API-First, Cloud-Native, Headless (MACH<sup>29</sup>) core and enable the construction of multiple asset or liability products on a single unified stack. With these foundations, the stack will extend a bank's ability to build a vibrant ecosystem to deliver seamless, omnichannel digital experiences for customers and internal applications for the bank, leveraging a network of services and partners.

And while the transition is hard, it is easier today than it ever was. Accenture argues in their 2023 Top 10 Banking Trends report<sup>30</sup>: "The likely disruption caused by a multi-year transformation was always a good excuse for sticking with your mainframe. However, today's cloud-native platforms not only dramatically reduce the timeline; they also allow migration and the launch of new

products to be done progressively, which reduces the risk. The ROI has improved dramatically".

The clock is ticking. Banks may see a significant impact on revenue if they do not adapt and invest. According to Accenture, 2023 will see a confluence of factors drive many banks around the world to reconsider their legacy core systems. Their survey of almost 100 top banks shows 63% are either in the process of moving their core systems to the cloud or getting ready to do so<sup>31</sup>.

**The time to act is now.**

# About Zeta

Zeta is a next-gen card processor. Zeta's platform empowers issuers to launch next-gen credit card programs with its cloud-native and fully API-enabled stack that includes processing, issuing, lending, core banking, fraud, loyalty, and many other capabilities. Zeta has 1700+ employees & contractors with over 70% in technology roles across locations in the US, UK, Middle East, and Asia. Globally, 35+ customers have issued 15M+ cards on Zeta's platform. Zeta has raised \$280 million from Softbank Vision Fund 2, Mastercard, and other investors at a \$1.5 billion valuation.



## Connect with us



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