



## Research article

# API integration and organisational agility outcomes in digital music platforms: A qualitative case study

Joshua Ofoeda<sup>a,\*</sup>, Richard Boateng<sup>b</sup>, John Effah<sup>b</sup><sup>a</sup> University of Professional Studies, Accra, Ghana<sup>b</sup> University of Ghana Business School, Ghana

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## ABSTRACT

Organisations deploy digital platforms to maximise value and transform their businesses. The success of most platforms is attributed to Application Programming Interfaces (APIs), the protocols enabling different software to communicate with each other. However, previous research on APIs has predominantly focused on the technical dimensions, such as design, and unintentionally neglected other social areas, such as organisational outcomes. This study seeks to advance organisational API research by adopting an agility perspective to explore the agility outcomes after API integration. Through rich qualitative data from a music digital firm, the findings revealed four primary agility outcomes: *customer agility* in the form of swift customer feedback, *operational agility* in the form of improved business process and delay reduction, *partner agility* in the form of embracing flexibility in processes and structures and expanding their ecosystem and *decision agility* in the form of fast decision making. A model showing the interplay and interdependencies of the agility outcomes was developed and provided depth and clarity to the findings. This study extends the literature by establishing how API integration influences organisational agility under conditions such as possessing capabilities and managing tensions during the integration process.

## 1. Introduction

Organisations face significant changes and disruptions in their environment, demanding that they plan and adapt quickly [1]. The changes require that organisations strategically position themselves to sense changes in the business environment and respond appropriately [2]. Digital technologies integrating diverse innovations have become integral as they bring changes across individuals, societies, and organisations [3,4], leading to the transformation, growth and prosperity of businesses [5,6]. Entangled with intelligent tools and sound algorithms are digital platforms that are fundamental to the digital transformation that firms are experiencing [7]. With digital platforms being core to digital transformation, it is vital to highlight the critical role of software in transforming business and society [5]. Unfortunately, many businesses lack an understanding of digital organisation as they believe purchasing pieces of software is enough. Nevertheless, the software can only make a difference if integrated with other applications [8]. Application Programming Interfaces (APIs) are a vital component of the software ecosystems related to software architecture that specify how applications and systems interact [9]. Technically, they are designed interfaces that define specified functions and protocols that enable applications to access and exchange facilities. APIs have become the building blocks that support digital transformation [10,

\* Corresponding author.

E-mail address: [joshua.foeda@upsamail.edu.gh](mailto:joshua.foeda@upsamail.edu.gh) (J. Ofoeda).

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11]. APIs are valuable boundary resources used by firms to increase their ecosystem generativity by opening their platforms to third-party developers [12,13] and to provide developers with the main functions of the platform [14]. Many organisations leverage APIs as strategic tools that enable third-party developers to become powerful complementors, expand their platform reach [15], and generate information [16,17].

Generally, the role of APIs in the digital ecosystem has attracted research attention but with more emphasis on areas such as API design and programming [18–20]; API security [21,22]; API management [23,24] and API documentation [25,26]. These valuable studies provide insight into the technical nature of APIs, such as design, security and management. Despite these insights, other areas, such as socio-technical dimensions [27,28] and the outcomes of API-based agility [29] are needed. These needs are justified below:

First, existing research appears one-sided (technically-focused), arguably because APIs were mostly conceptualised as technical systems and limited to the domain of developers [11,27]. Thus, there is less attention on other social concepts like agility at the individual, firm or multi-firm levels [30–32]. API integration within organisations significantly influences strategic transformation and decision-making [33]. However, its broader implications, including monetisation [34], institutional integration perspectives [35], pricing strategies [36], and value creation [11,37] highlight its socio-technical dimensions. Studies suggest moving beyond the technical view to consider APIs as socio-technical systems [27,38], emphasising their role in digital transformation across various organisational aspects [10,11], and not just within the domain of developers.

Second, in response to rapid market changes, organisations must quickly adapt, a need made more evident by the 2020 Coronavirus outbreak. Companies like Uber, Zoom, and Netflix successfully navigated these challenges through agile responses enabled by API integration, highlighting APIs' role in facilitating organisational agility and innovation [16,39,40]. However, there is a lack of empirical understanding in exploring the specific forms of agility achieved through API integration, underscoring the need for further study in this area [41].

To sum up, the volatile business environment and the need for organisations to remain competitive have heightened the need for API integration and agility. However, the existing links need to be better understood. Specifically, this study emphasises the need to understand agility outcomes when integrating APIs. Based on these gaps, the research question concerns “*What forms of agility do firms achieve after API integration?*” This paper uses a case study of a global south digital music organisation to explain API-driven agility (agility through API integration) to answer the research question. The selected company has undergone significant transformation and leads the way as an API-driven business. The focus on a digital music platform also addresses the need for research on small firms [42] as they contribute significantly to the growth of the global economy [43]. In many emerging economies, small and medium-sized firms provide over 60 % of jobs and are major contributors to the local economies [44]. This study contends that investigating the organisation's API journey and the outcomes achieved will offer new insights into the API economy in Africa. This study relied on the organisational agility literature to examine organisational agility after API integration. Following an inductive data analysis, the findings show varied organisational agility. Specifically, the study found how the organisation overcame tensions during the API integration process to achieve four primary agility outcomes (*customer, operational, partner, and decision agility*). The study contributes to the ongoing research in organisational agility and provides unique theoretical explanations of the aggregated organisational agility outcomes after API integration. This study also contributed to the United Nations Sustainable Development Goals 8 and 9 as it enhances understanding of using technologies and related innovations to improve human lives and society.

The theoretical background is presented in the ensuing sections, followed by the methodology in section three. Section four presents the case study results, followed by a discussion of the study's theoretical and practical contributions. The limitations and future research direction are then presented.

## 2. Literature review

### 2.1. Organisational agility

While agility has been a concept for decades, its importance is increasingly recognised by IT business executives as a dynamic capability crucial for addressing rapid environmental changes [39,45,46]. Proponents of strategic agility argue that the term has come of age in an era where businesses face many threats, uncertainties, and opportunities from the seen and unseen [39]. To date, varied definitions for organisational agility have been provided [47,48]. Most information systems studies seem to converge on agility being a higher-order dynamic capability [49], where dynamic capability explains an organisation's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments based on a sense-seize-reconfigure process [50,51]. Recent research highlights agility as a crucial dynamic capability, enabling organisations to swiftly sense and respond to market opportunities [48]. As one of the dominant theories in information systems, the dynamic capability theory provides support/lens to understand better organisational agility, especially regarding how they build adaptability and flexibility to respond to the uncertainties in the market caused by innovation and competition. Specifically, dynamic capabilities are needed to foster organisational agility [52]. This is because agility provides the mechanism that helps identify and exploit opportunities [45]. Some recent works further tied agility to dynamic capability, explaining it as how organisations sense and respond to market opportunities [42]. Organisations that develop their capabilities are well-positioned to continuously scan, sense and respond to market changes by reconfiguring their resources and capabilities [48,53]. This study, therefore, relies on dynamic capabilities theory as the underlying framework for understanding organisational agility. Dynamic capabilities include innovative processes, flexible resource allocation, partnerships and decisions, etc.

Agility incorporates management concepts such as absorptive capacity, market orientation, and strategic flexibility, facilitating a firm's innovation by effectively using its assets, knowledge, and relationships in dynamic environments [45,54]. This evolving

understanding of agility positions it as essential for organisations aiming to succeed in unpredictable and rapidly changing contexts [55]. Table 1 summarises selected agility definitions, guiding theories and the underpinning methodologies from the selected information systems papers.

Agility, often equated with flexibility, encompasses an organisation's proactive stance, capacity for change, and survival in volatile markets. Early discussions emphasise agility's role in enabling organisations to navigate threats and leverage opportunities through IT investments, promoting innovative responses and timely actions [47,57,60–62]. Effective agility implementation enhances the dynamism, scalability, and cost-efficiency of products and services. Conversely, poor agility practices can lead to rigidity, causing delays and inefficiencies [39,63]. As McGrath [64] and Tallon et al. [39] highlight, organisational agility encompasses adaptability and stability. McGrath [64] emphasises that successful organisations must balance being flexible and adaptive with being resilient and reliable. Tallon et al. [39] further elaborate that agile organisations adeptly manage and reallocate resources to meet demands while maintaining customer satisfaction, cultural values, talent retention, and stable leadership. The challenge lies in striking a balance between agility and stability, with organisations striving to achieve strategic agility without compromising essential stable elements.

Core elements of agility include sensing changes and opportunities and responding accordingly; thus, a sense and response process. Sensing explains organisations' ability to detect and anticipate environmental changes and what opportunities exist in the market. Such capabilities ensure that businesses can sense and monitor their consumers' expectations, preferences and competitors' actions [54,65] by identifying and interpreting signals from the market [66]. Most studies on sensing focus on using analytics and data warehouses as IT resources to address strong market signals [39,42]. But there are weak signals that could also prove vital. Hence, organisations must develop capabilities that quickly navigate turbulent environments to identify weak signals. Plausible areas to look out for weak signals are outside the organisation since they are characterised by noise and could bring about changes that the organisation least expected [39].

Responding refers to organisations' ability to implement changes to seize market opportunities and environmental challenges successfully. Thus, by analysing the sensing information, businesses can respond through the necessary actions [54]. The responses could vary from strategic to simple organisational operations changes [65]. Considerable research exists on the various response areas, including using human, administrative, and IT resources to enhance organisational operational performance [39,57]. More recent studies highlight organisational capabilities needed to use, leverage, and reconfigure organisational IT resources in hyper-competitive and turbulent environments [6,39]. Despite the progress in agility research, there are some unaddressed issues since most organisations cannot wait and anticipate proven and mature capabilities before they apply them. Some organisations adopt a piecemeal approach to improve their capabilities and resources on trial and error [39]. Based on these arguments, most agility research has focused more on the responding component, premised on the assumption that there can only be a response if there are already sensed changes [39].

Another essential aspect of the organisational agility literature worth mentioning is the decision-making capabilities of organisations. The interpretation of the opportunities gathered from the market informs the organisation's decision process; hence, decisions must be made by considering the knowledge of the past and present [42]. Before responding to any situation, there is a need to have scenarios and experiments to lead organisational action plans [42,48,52]. To execute action plans, the organisational resources and capabilities must be swiftly reallocated [67]. In all, the ability to sense and make decisions through interpretation and responding must work together for us to have an agile organisation.

Despite the increased use of agility in information systems research, its conceptualisation is more traditional [50] than contemporary. While there is much interest in how organisations achieve agility, there is difficulty in explaining how these works [68]. More important is how it relates to specific innovations such as APIs. In their recent study, Levallet and Chan [48] noted the need for studies examining the specific nature of innovations (e.g., APIs) for agility, especially from different environmental contexts where events occur differently. API innovations possess disruptive features since they can fundamentally reshape how businesses operate. Such

**Table 1**  
Agility descriptions from selected studies.

Author(s)	Agility Description	Guiding Theory	Methodology
Sambamurthy et al. [45]	An organisation's capacity to detect and take advantage of market opportunities with precision and speed	Dynamic Capability	Conceptual
Levallet & Chan [48]	Capabilities that emphasise sense and response process aimed at addressing environmental events	Dynamic Capability	Qualitative
Zain et al. [56]	How firms respond to the challenges emanating from an environment dominated by risks, change, and uncertainty	Technology Acceptance Model (TAM)	Quantitative, survey
Overby et al. [54]	The ability to sense changes in the environment and respond readily	Dynamic capability	Conceptual
Tallon and Pinsonneault [53]	The ability to quickly detect and respond to market opportunities and threats with speed and dexterity	Resource-based view; Theory of IT alignment	Quantitative, survey
Teece et al. [52]	An organisation's capacity to efficiently and effectively redeploy/redirect its resources to create value	Dynamic Capabilities	Conceptual
Lu and Ramamurthy [57]	The ability to swiftly cope with persistent and uncertain changes and survive in an environment where there are frequent and unpredictable changing opportunities	Capability Development and Complementarities	Quantitative, survey
Vervest et al. [58]	A firm's ability to respond rapidly to fulfil unpredictable orders from clients	Networking Theory	Conceptual
Ngai et al. [59]	Responding to unanticipated market changes and converting these changes into opportunities	Resource-Based View	Case study

transformation can lead to agility, enabling businesses to adjust and swiftly respond to market changes [69]. For instance, Uber and Airbnb have disrupted the taxi and hospitality industries [70] by leveraging APIs such as Google Maps as core complementors and offering excellent experiences like location services that Uber and Airbnb do not possess. Similarly, APIs and other digital innovations continue to disrupt the traditional process of selling music as they provide a more efficient and streamlined process. With the emergence of digital music platforms, traditional music sales on CDs keep declining [71]. However, the existing literature has not fully addressed how agility is achieved when digital music firms integrate APIs.

## 2.2. Digital platforms, ecosystems and APIs

Digital platforms are considered value-creating interactions between customers and their external producers [17,72]. Digital Platforms also refer to the common and shared services that host complimentary offerings [73]. With their high proliferation, digital platforms challenge incumbent firms as they change how digital products and services are provided and consumed. While most traditional setups create value within established boundaries, digital platforms leverage ecosystems to create value [17]. To manage the demand and supply within their ecosystem, digital platforms must leverage various innovative technologies [74]. Actors on the demands side of the ecosystem who mostly assume the role of complementors develop complementary goods and services by using boundary resources such as APIs and software development kits (SDKs) provided by the platform owner [16,17]. By consuming services offered by organisations with digital platforms, we can listen to our favourite music on Apple Music or Spotify or watch movies using Netflix [75]. Other examples include social media platforms like Facebook, which has revolutionised people's connections with friends and family. Convenient payment platforms such as PayPal have also led to an increase in the adoption of e-commerce sites.

Another primary need for innovation among organisations is the volatile business environment, which has contributed to a change in customer demands [76]. However, the nature of business operations requires organisations to mimic the example of biological organisms that occupy different environments but can interact with each other. To do this, they must rely on technologies allowing such interactions. As Moore (1993) [77] suggests, organisations cannot be perceived as single business entities but as belonging to an ecosystem that covers various industries. Since survival alone is difficult, businesses must create new networks (supporting dependence on each other) that facilitate the exchange of goods and services while providing better customer value [78]. Digital platforms support the connection networks from two sides, creating a more robust network effect. Some of the most successful global businesses, such as Facebook and Amazon, have become powerful as they admit more network members, driving competition [72].

At the centre of platform business models are technologies that connect people, organisations, and resources in an interactive ecosystem to create value [42]. Generally, digital platforms increase their function and scope by leveraging complementary add-on products and boundary resources from third-party developers in their platforms [79]. APIs are valuable boundary resources that firms leverage to boost their innovation drive. These boundary resources and complementary add-on products are provided mainly by third-party developers [79]. Organisations rely on APIs at various levels to access critical services provided by digital platforms. APIs have become critical elements that drive most digital platforms and ecosystems (Fig. 1).

Technically, APIs are basic specifications, routines, and protocols that developers need to build software applications and specify how different software programs interact [80]. APIs have existed since the 1990s [41] and have become the standard inter-system communication mechanism. APIs reduce the burden of integrating two applications, thus fostering innovative application ecosystems [81]. With most legacy systems facing many challenges, APIs have become a key to solving legacy systems' limitations. The siloed nature of legacy systems does not guarantee seamless communication between external components [81]. APIs are ideal for helping bridge that gap between multiple legacy systems; hence, businesses consider them an integral part of their business transformation agenda [82]. They have also emerged as critical components for interoperability and interconnection, and organisations are easily connected with their partners and customers. APIs can also be considered the digital glue connecting isolated and disparate systems,

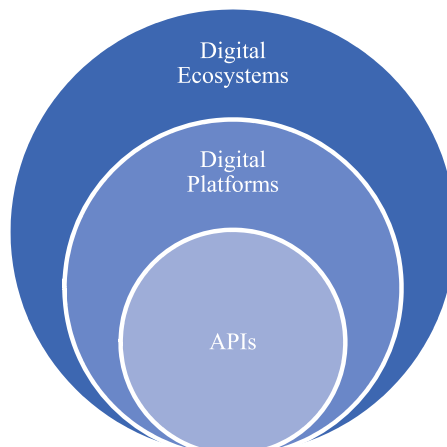


Fig. 1. Digital ecosystems, digital platforms, and APIs.

allowing them to interact seamlessly [83]. This endeavour permits businesses to increase their immediate digital footprints while enhancing customer satisfaction. The critical role of APIs in developing digital ecosystems cannot be overemphasised as they empower businesses to partner and work together [84]. More importantly, API supports competition as rival firms can partner to provide integrated and more customer-oriented services. The 2018 announcement between Facebook, Microsoft, Google and Twitter (now X) is a classic example. This example ensured easy data transfer among their platforms [85]. This requires each platform to open some core service functionalities while helping them grow their customer base and increase their reach. To achieve interconnection, three main actors are needed to pursue an API-driven strategy: API providers or developers, API consumers, and application end users. Since platforms and ecosystems are fueled by mutual value, APIs must bring value to the various stakeholders and actors within the ecosystem [86].

To combine the issues, whilst APIs can lead to organisational agility, little evidence supports how APIs achieve this feat at higher levels. Few research works have emphasised the role of APIs in achieving agility [41,87,88]. Regrettably, these studies have not adequately addressed how agility occurs [42]. Specifically, we focus on the forms of agility achieved with API initiatives due to sensing and responding [39]. In responding to these limitations, this study focuses on APIs to understand how their integration leads to organisational agility. Considering how agility is sensitive to specific contexts [52], it is essential to understand how it is realised in other contexts like Ghana. Whereas stable markets can be profitable by optimising operations, volatile markets like the Ghanaian context face many uncertainties; therefore, agility is most likely needed.

### 3. Methodology

This study adopts a qualitative case study [89,90] to understand API integration outcomes. The choice of a case study ensures the examination of a contemporary issue and offers a better understanding of information system innovations such as APIs and their organisational contexts [91,92]. Qualitative case studies aided in understanding the study participants' subjective perspectives of the API concepts rather than the generalisation of larger groups [93]. Tallon et al. [39] advise that due to the growing uncertainties and the context sensitivity of agility, there is a need for qualitative studies to tackle the issues. The resources firms need to sense and respond to positive opportunities in stable markets differ from those required in turbulent markets [39,52]. iMuse (pseudonym) was selected for this case study as it demonstrated an organisation that showed agility amid stiff competition and disruption. iMuse was strategically selected instead of a statistical selection [94], as it required that we know about the organisation's characteristics before the study began. The strategic selection also helped us provide valid explanations for the research question [95,96]. The selection of iMuse also addressed Park et al.'s [42] gap in the need for organisational agility research in small and medium-sized companies within fast and unpredictable environments [48].

#### 3.1. Case background

iMuse is an electronic marketplace that sells music and operates from Ghana (a developing country in West Africa). iMuse focuses on connecting musicians to their fans, thus allowing them to upload their songs for fans to purchase. A distinctive feature of iMuse is its focus on selling indigenous African music. This strategy makes it different from other digital music platforms like Apple Music. Many artists who use the platform describe it as African and artist-centred due to the ease of use and profit they generate from the platform.

Three interrelated factors accounted for the development of the music platform. Earlier, the company created a website that enabled customers to purchase songs. The website allows the customers to pay for songs using the company's mobile money account, after which the company delivers the songs on CDs. Following complaints of delays, delivery of defective products (CDs), and several other internal and external inefficiencies, the CEO developed a platform allowing customers to purchase songs from anywhere using multiple payment methods. Another factor that necessitated the platform's creation was the report of a renowned Ghanaian artist whose death was reported due to his inability to pay his medical bills [97]. Considering the artist's popularity and status in the music industry, one may think he made much profit in his music career. Being touched by this incident, the platform owner resolved to help artists make money from their intellectual property. Hitherto, most musicians make money through live shows, especially in Ghana, and those who do not have such opportunities are left behind. The last factor was to minimise the growing effect of pirate music sites, especially in Ghana. Such a phenomenon has led many people to download songs from pirate sites at the expense of regulated ones, contributing to losses for musicians.

iMuse has two related API-enabled platforms, thus streaming and downloading platforms. The download platform is available via the web, while the streaming platform is available via iOS and Android apps. Customers can download the app for free, generating revenue through streams, subscriptions, and user advertising. The patronage of iMuse has made it one of the most visited indigenous music platforms in West Africa.

#### 3.2. Data collection

Interviews were used for the data collection. Twenty-two (22) interviews were conducted, with an average session lasting about 40 min. Participants were selected until data and theoretical saturation were reached. Participants included the CEO, Business development manager and content developers. We consider these participants desirable as they form part of the top-ranking executives, are skilled professionals in API development and integration and possess capabilities that others do not [98,99]. We recruited multiple participants at different levels of the organisation to capture different perspectives and experiences on how their API journey and outcomes were achieved [100]. Data was collected from willing and available participants and at their convenience. This ensures that

participants participated voluntarily without coercion and that collected data was of the highest quality. Follow-up interviews were conducted with some participants on issues we need further clarification on [48]. Table 2 shows a summary of the profile of the study participants.

A semi-structured interview guide was developed to ensure flexibility and adaptation to the questions and prevent deviation [70]. The semi-structured interview guide also aided in exploring issues brought forward by the participants in greater detail and conforms with the chosen methodology [101]. The interview questions were structured around API innovations and their nexus to organisational outcomes. For instance, questions relating to the knowledge of the pre and post-API era and how they integrated APIs were necessary to unearth the outcomes of the API initiatives. The questions were developed based on outcomes of the existing literature and insights gained from scholars and experts in digital innovations like APIs [102] to prompt in-depth responses from the participants that address the research question. Participants received copies of the interview questions ahead of the main interview to familiarise themselves and feel comfortable while responding. All the interviews were conducted in English, and with the participants' permission, the interviews were audio-recorded using a tape recorder and transcribed for analysis in Microsoft Word. Tape recording is touted to be an ideal method of capturing interviews due to the nature of the semi-structured interview protocols as a source of accurate data, reducing bias [103,104]. To ensure accuracy, participants reviewed their interview transcripts [48]. Before the main interviews, we conducted test interviews with colleagues with knowledge of API development (but the data was not used in the main analysis). The pilot interview helped us to gain a deeper knowledge of the phenomenon and nature of participants and clarify the research questions before the main data collection [93].

We also relied on secondary data to complement the primary sources. Organisational documents, project reports, and media reports facilitated understanding of the phenomenon and maintained evidence that can be verified easily [48,70]. The secondary data also ensured that the authors obtained first-hand information on the organisation's history and how it leverages API initiatives to remain competitive.

### 3.3. Data analysis

The analysis follows Corbin and Strauss's [105] open, axial, and selective coding approach, ensuring rigour in analysing the data and overcoming bulky unstructured data limitations. The approach is linked to the grounded theory method [106,107] This approach aided in investigating patterns and relationships in the data through its organisation and examination [107] and overcoming challenges by analysing huge unstructured qualitative data. Using the research question as a guide, the analysis began with the first phase, open coding. It involved breaking down and labelling the interview data into discrete forms [108]. For instance, "as a young company, we resolved to be relevant" was coded as "relevance in business." The outcome of this phase is the first-order codes. Table 3 provides a few instances of open coding used in this study. The second phase involved axial coding, in which similar first-order codes were grouped into an abstractive second-order construct. For example, "opening up operations" and "need for new partnerships" were named "boundary openness." The last step is the aggregated theoretical dimensions generated from the second-order constructs [105]. For example, second-order codes such as "customer insights" and "customer satisfaction" were coded as "customer agility."

To validate the findings, we used data from other sources, such as documents besides the interviews. Participants were sent copies of the transcribed interviews to review and provide feedback when necessary—such steps guaranteed data triangulation to verify the research findings. A continual iteration between the data, the research findings, and the theoretical foundation was undertaken until a saturation point was achieved. Fig. 2 presents the data structure of organisational agility outcomes amid API integration based on first-order codes, second-order constructs, and aggregate theoretical dimensions.

## 4. Findings

The study's empirical results are presented based on the emerging concepts and themes, as shown in Fig. 2.

### 4.1. Survival instincts

iMuse's initial operations were characterised by several challenges that negatively impacted the operations and image of the firm. However, the desire to succeed was a significant enabler for survival. With the manual process not yielding the intended results, the CEO was compelled to embrace innovations and implement initiatives to make iMuse relevant and highly competitive. The CEO

**Table 2**  
Summary of interviewees' profile.

Interviewee	Number of interviews	Follow up interviews	Total
CEO (Platform Owner)	4	1	5
Content Developer 1	3	1	4
Musician	2	–	2
Business Development Manager	3	–	3
Manager, Innovation Services	4	1	5
Content Developer 2	2	–	2
Music lover	1	–	1
<b>Total</b>	<b>19</b>	<b>3</b>	<b>22</b>

**Table 3**  
Instances of open coding.

Themes	Sample Quotations
Survival/Business Continuity Instincts	The competition we face as a business calls for survival strategies. Besides, we also want to ensure continuity and not fade out.
Customer Agility	We solicit views from our customers through our support services that are API-enabled. Likewise, we give them (customers) what they want. Recently, they wanted some indigenous African symbols displayed when they stream, and we did just that.
Organisational and third-party rigidity	It was disheartening that some well-established organisations turned us down when we came up with ideas that would benefit us both. Some will tell you that they cannot change anything in their system because of us.

emphasised in the following quote that entrepreneurs face the daunting task of survival.

“I came to a place where I told myself I could not survive alone, especially in a country like ours. That admission was the beginning of the changes we see today. I reckoned that even the most successful businesses globally still need help from others.”

Key issues emanating from survival instincts include the desire to remain relevant. iMuse was looking beyond survival to become a relevant and notable brand in the digital music space. In a competitive and dynamic environment like the digital space, there was the need to possess capabilities to make businesses profitable while maintaining customers. This is critical as an organisation’s existing customers can switch to competitors if they do not get value, thus negatively impacting the organisation’s image and output. The manager of innovations intimated that:

“The market is very competitive, and we need to be relevant, or else we will lose our customers and clients to our competitors.”

Meanwhile, the success stories of other organisations played a critical role in the survival instincts of iMuse. The need for survival became a source of learning opportunities and inspiration for iMuse. iMuse achieved this by exploring and analysing the success stories of established organisations in the digital music space. It ensured that iMuse got insights into the innovative approaches and strategies used and learnt from the challenges of successful incumbent firms and how they overcame them. Through these observations, iMuse enhanced its survival instincts and could make informed decisions that positioned it for growth. The CEO intimated that:

“The success and sometimes failures of other firms became a learning process for us. For instance, we realised how Apple Music relied heavily on APIs to become what they are today.”

Following the success stories was that iMuse keeps up with industry trends. Understanding the trends ensures iMuse stays up-to-date on emerging technologies, customer demands and preferences and how API implementation can impact them. These trends afford iMuse opportunities APIs offer that drive innovation and provide solutions that address customer needs. The manager of innovations highlighted that:

“iMuse is determined to impact the digital platform space; hence, we keep up with the industry trends. We deem this critical as it helps us to remain relevant and competitive in the music industry.”

#### 4.2. Boundary openness

Generally, API integrations focus on connecting and interacting with third-party systems, thus promoting innovative collaboration. Essentially, boundary openness demands that platforms and organisations possess a flexible mindset to establish interfaces and connections. Such a mindset helps to explore new territories that the business should have explored in the past. At iMuse, there was the need to become flexible and accommodate other systems by establishing new partnerships. A content developer noted that:

“We came to a point in our operations where we needed to forgo a rigid mentality and open up our operations to partners to improve our platform and increase our reach.”

With the desire to survive and ensure continuity, a reliable technology to address the existing challenges was needed. But iMuse, at the time, had limited resources to realise this objective. One of such limitations was developing a payment platform for accepting revenue. Therefore, it needed to partner with companies with payment platforms, one of which is a leading telecommunication company in Ghana. The CEO explained:

“I wrote to some companies with payment platforms to integrate my application, but many were not interested because they felt we were not a big company. However, TNT (pseudonym) understood our vision and integrated with us.”

The manager of innovations also emphasised that:

“In this era, you do not have to own every resource. Someone else has what you need and is also looking for people like us to come and use. It is a matter of having a shared understanding.”

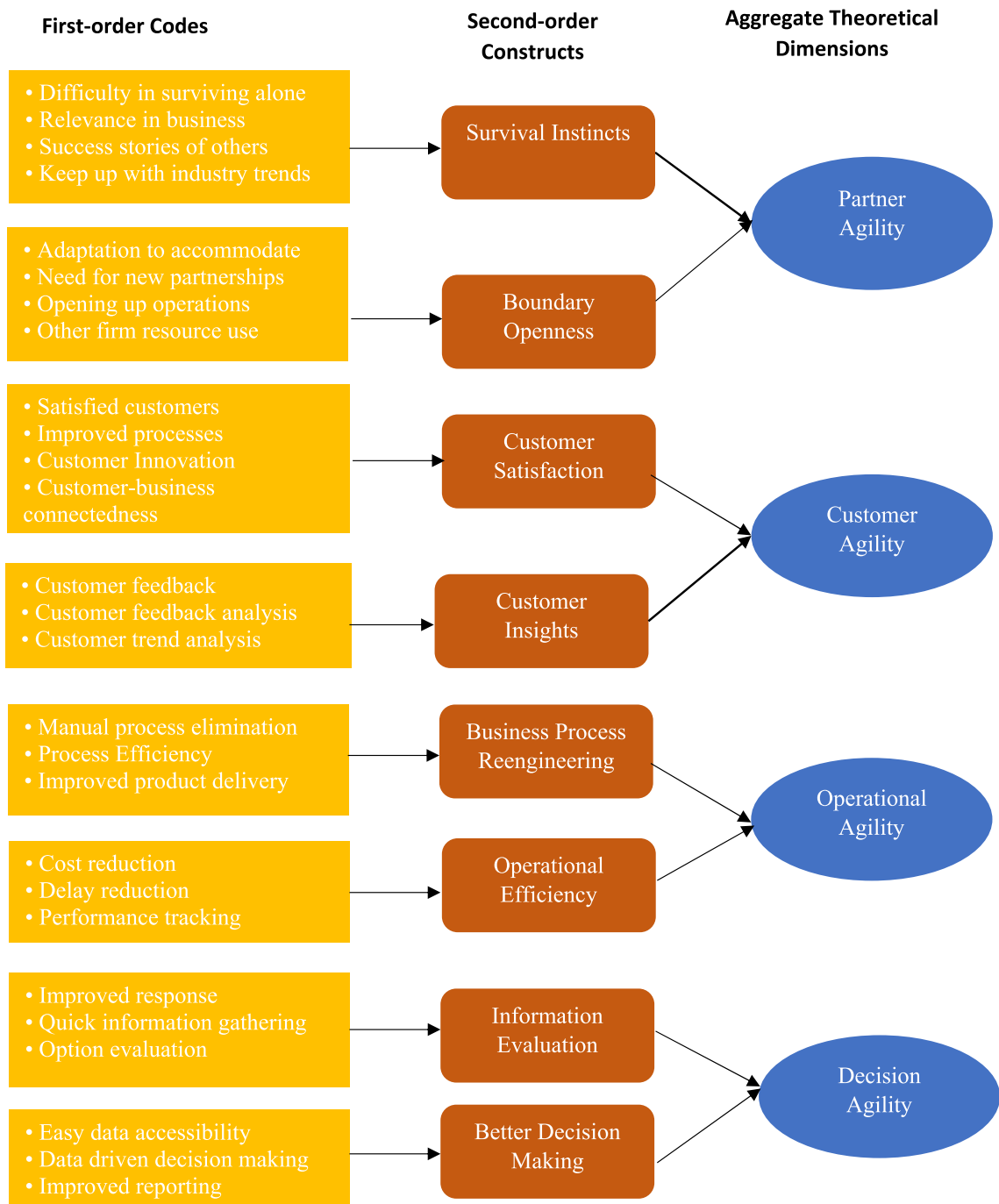


Fig. 2. Structure of data related to organisational agility outcomes.

### 4.3. Customer satisfaction

With customer satisfaction being a major concern for iMuse, it needed to provide customers with appealing features and a personalised user experience. The Pre-API initiative or integration era generally involved manual interactions between the company and its customers. As pointed out in the case description, customers who wanted to purchase music had to visit iMuse’s website and choose their preferred song, after which they were given the company’s mobile money number through which they were required to make payment. After payment confirmation, the songs were written on a CD and delivered to the customer. As a result, the entire process was fraught with several inefficiencies and delays, resulting in unsatisfied customers. A content developer recounts some past experiences:



“We had complaints from the users about delays in getting their purchased songs delivered and even sometimes non-delivery of the product or delivery of defective products.”

A user of the site also recounted that:

“Those days, you must wait for delivery guys to bring your song on a CD. Sometimes you realise the CDs are broken and must call the company to inform them. It was a long process and very frustrating.”

The pre-API integration era, predominantly manual, also showed errors, inefficiencies, and duplications of customer orders. For instance, there were instances where iMuse sent the wrong songs to customers. The CEO emphasised these challenges in the following:

“I remember an incident where a customer requested a particular song, but we wrote a different song on the CD and delivered it to them. You can imagine how embarrassing that was.”

The post-API integration, however, suggests that customers are more satisfied when using the digital music platform, improved processes and improved connection between the business and the customers. Customers and users of the API-enabled platform enjoy the convenience and great user experience, thus leading to satisfied customers. The API integration provides users with the required functionalities that meet their unique needs and preferences. Happy customers will likely use the platform, which will help iMuse determine its loyal customers. The CEO highlighted the importance of satisfied customers.

“We prioritise customer satisfaction, so we provide personalised experiences to keep our customers and bring new ones. We want our customers to feel that they are valued.”

Social media API integrations are a major medium iMuse uses to promote customer connectedness. With increased social media use, businesses like iMuse leverage such tools to connect and engage with customers. This results in projecting the platform’s brand and maintaining and growing customer relationships. Social media has helped with content postings and monitoring social media interactions. A content developer emphasised the critical role of social media API integrations.

“We continue to build lasting relationships with our customers through social media. Besides our usual posts, we have API integrations via the major social media platforms, which allows customers, especially the loyal ones, to share our content on social media.”

#### 4.4. Customer insights

During the pre-API integration era, customer feedback iMuse collected was fragmented because feedback was collected manually. Customers and platform users send their feedback via phone calls and emails or walk to the office to make a complaint. Such a manual and fragmented approach is time-consuming, fraught with errors and makes feedback analysis complex. The manual and fragmented method also makes information consolidation difficult and hinders iMuse from extracting and using valuable customer feedback. These occurrences have also contributed to a lack of a standardised feedback mechanism and constrained iMuse’s ability to identify patterns, themes and trends critical to appreciating and responding to customer needs. API integration ensured that processes and employees quickly responded to changes. For instance, real-time customer feedback ensures that iMuse responds quickly and helps in its strategic decision-making. Responses were made early and based on reliable data collected from the customers. The CEO recounted:

“Customer feedback is important to us, so we developed systems to capture them in real-time. Our team analyses and presents the feedback for swift decision-making.”

Through social media content, iMuse gathers relevant customer information and market trends necessary to improve its processes. Insights such as customer feedback and market trends are used to design appropriate market strategies that resonate with customers’ needs. Customer insights are also ideal sources of information for understanding customer behaviour and predicting their future preferences, which helps generate insights that support the decision process. Essentially, customers become part of the organisation’s innovation through an active engagement process. Such innovation co-creation has introduced new ideas and perspectives to how iMuse operates. The CEO emphasises the critical role of customers in innovations at iMuse:

“We give our customers what they want. For example, through our engagement, some mentioned that we included some African symbols on the site and app to distinguish it from other Western ones, and we did, and it proved beneficial.”

#### 4.5. Business process reengineering

The era of API integration resulted in a radical redesign of iMuse’s initial processes, which were mainly manual, to achieve better outcomes. API integrations helped iMuse reengineer its processes, which helped reduce risks associated with its operations. Before the API-enabled platform, several processes were unaccounted for. For example, customer payments were manually verified and took long hours to complete. The API integration eliminated these manual processes, and the activities collapsed into a single transaction. The CEO explained:

“After the payment API integration, the platform accepts payment from multiple sources like mobile money and visa cards, doing away with the previous manual and cumbersome processes.”

The previous manual process does not allow customers to personalise their songs, stream, download, and make recommendations. API integration, however, has revolutionised customer experience and increased platform engagement. The music distribution channel has also been reduced as customers can purchase songs on the go without waiting hours or days. The payment API integration, for instance, automated the payment and inventory management process, thus enabling real-time updates. Online payments were possible because iMuse integrated its platform with mobile money providers and other payment platforms to enable customers to pay for music online. In this case, songs are delivered digitally as downloads or streams, and customers can download the songs in the iMuse app and play them conveniently. A customer recounted:

“I have been using the platform for some time and love it. The process of purchasing songs is seamless, and I can stream or download my songs on my phone or laptop.”

#### 4.6. Operational efficiency

Through streamlining and automation, iMuse reduced operations costs and increased productivity and operational performance. By leveraging public, internal, and partner APIs, iMuse extended its services to reach a larger market. Internal or private APIs helped streamline internal business processes, while public APIs helped consumers engage with iMuse through multiple channels such as social media, the web, and mobile. This has translated into an increased customer base, reaching thousands of new customers. The CEO highlighted that:

“Before embracing APIs, we did not have the numbers, but after integrating the necessary APIs, we have thousands of customers globally whom we continue engaging to improve their experiences.

The platform has also eliminated delays associated with processes. Key among them include the waiting period when customers make purchases. As noted earlier, the initial process was long and error-prone as manual verification of customer payments had to be made before songs were sent via courier services. These delays resulted in the company losing some of its customers to its competitors. Defective CDs delivered to customers necessitated several refunds being made to customers and the delivery of new products. The delays were eliminated as customers could stream and download songs via the mobile app or website.

The flexibility and convenience customers enjoy have proven useful compared to the frustrations of the initial physical processes. Customers with any challenge can quickly report it through iMuse’s 24/7 feedback generation system. In highlighting the transformation of the API-enabled platform vis-à-vis the manual era, a content developer explained:

“With our API initiative, now we operate 24/7, our reach has been increased, and people worldwide can purchase songs from our platform.”

Besides the easy process of purchasing songs, the platform is also easy to use. The CEO recounted:

“Customers who visit the platform can browse a variety of African music genres, and they can also rate and review songs of artists on the platform.”

#### 4.7. Better information evaluation

iMuse collects feedback from customers and platform users. However, the feedback, in most cases, has to be assessed and evaluated to determine its feasibility. Feedback evaluation helps to understand customer needs and detect operational areas that need improvement. At iMuse, feedback must be evaluated and aligned with the business goals to achieve the intended outcomes. iMuse’s API integration ensures that it gathers and evaluates information quickly in real-time from multiple external sources. The integrations with other systems, such as partners and social media integrations, ensure seamless data exchange. iMuse is presented with better evaluation options that inform better decision-making. The CEO noted that:

“Because the initial process was mostly manual, we spent much time analysing the feedback and delayed responding to market demands. However, because the systems are integrated, we quickly respond to market demands and trends.”

#### 4.8. Better decision making

The integration of APIs at iMuse plays an essential role in decision-making. API integration helps iMuse to access diverse forms of data from various sources, which empowers it to make organisation-wide decisions. Data-driven decisions are critical as they help iMuse gain better insights into consumer needs and market trends, enabling it to improve the quality of its products and services and drive performance. The CEO intimated that:

“Because we have been able to streamline the processes, information exchange from multiple sources/systems has become easy, so we have real-time data that we can analyse and make decisions immediately.”

The previous decision-making processes were mainly based on instincts and guts, as most data were collected manually and fragmented. This hindered decision-making at various levels at iMuse, mainly resulting in poor decision-making because the data and analysis were prone to error.

#### 4.9. Capabilities needed for API integration and rising tensions

The nature of APIs requires iMuse to possess capabilities for its development and integration. One of those core capabilities is human resource (technical competence), which demands personnel to have a technical understanding of application development to help integrate and maintain APIs. Other integral capabilities include IT/IS infrastructure and financial resources. For instance, employees needed working stations and tools to work effectively. Financial resources were needed to acquire most of these capabilities such as research and development and the acquisition of various infrastructures. Financial resources also helped to hire employees competent in API development and integration. The CEO averred that:

“We are a small company, but we know the essence of having the infrastructure and employees with the necessary skills. Due to the evolving nature of the tools, we need competence in various areas, such as programming. Without these competencies and capabilities, we cannot do anything.”

Despite possessing the above-mentioned internal capabilities, iMuse was constrained with other resources it needed to improve its services. iMuse could not provide certain services because it did not own them, compelling it to partner with those within its ecosystem. For instance, iMuse’s initial website did not support online payment because it did not own a payment platform. With the desire to integrate multiple payment channels, iMuse had to open its boundaries (systems) to accommodate other systems (i.e., payment systems). Extending its boundaries implied that iMuse lifted restrictions on its systems to accommodate different systems. With the desire to run the business 24/7, having various payment methods on its platform was non-negotiable. The manager of innovation services noted that:

“Experience has taught us that you do not have to own everything in this era of technology. Someone else has what you want. What you need to do is to let the person know, and you can use that resource. We wrote to some institutions to use their payment platform and reached an agreement.”

In some cases, however, third-party integrations faced challenges we categorise as tensions and rigidities. For instance, some third-party organisations exhibited rigidity concerning the kinds of technology they use. Such tensions accounted for some shortfalls that occurred during some integrations. Typically, integration between firms needs some form of compromise between them. However, there were situations where some firms insisted on doing things their way. Employee ego and technical incompatibility were specific factors that contributed to such tensions. The CEO laments:

“Years ago, we sent our integration request to a service provider. Unfortunately, that did not materialise. Their developers were strict on using IP endpoints when we did not have a dedicated server. We asked them to use URL endpoints since that was what we had, but they declined, and that was it.”

#### 4.10. API-enabled sensing and responding

With data from multiple sources, organisations must leverage innovations to gather information relevant to their operations. For iMuse, social media is a major source of real-time data as it can monitor the market, analyse, and respond accordingly. The response aims to improve customer experience by proactively addressing customer challenges. A content developer affirms that:

“Social media APIs help in gathering information in real-time. We can monitor happenings on social media and other web outlets. We can monitor new genres of music in Africa, artists, and what customers say about our platform.”

Considering the increasing competition in the digital music platform space, responding quickly to the market is vital for competition. A team analyses the trends and patterns in the market through monitoring and responding by providing tailor-made content for the customers. Because APIs integrate other systems, they ensure that all integrating organisations share data, thus establishing the seamless interconnection between iMuse and its integrating partners, which limits manual data exchange and transfer. For instance, the continuous data exchange between iMuse and TNT, the payment platform, reduces errors and time, thereby improving services. Once these things are achieved, iMuse can respond to customers on time through improved decision-making. For instance, iMuse can determine which songs sell most on the platform in real-time. A content developer recounts how integrating with other applications improved their work:

“Once we integrate with other people within our ecosystem, we eliminate errors in our processes while reducing time in completing a transaction.”

Another exciting thing is the establishment of partnerships. Building ecosystems is a core feature of API integrations; it ensures that the companies involved innovate by building solutions that can address the needs of their customers. iMuse leveraged the resources and expertise of the partners within its ecosystem by extending its core services to cover multiple payment methods. With many Ghanaians using mobile money payment, a partnership with Ghanaian telecommunication and other platform service providers was crucial. However, considering the CEO wanted to leverage other payment methods such as PayPal and Stripe, there was a need for further partnerships. The CEO noted the importance of partnership in the following statement:

“The best decision I ever made was to partner with other companies. Suppose I had thought of partnership way before; I would not have suffered as I did. With APIs, you do not need to own all the resources, and you can connect with other companies and use their resources, which was what we did here.”

The innovations manager also emphasised the following:

“While selling our music, do not worry so much about the financial aspect of accepting payment because another organisation is collecting the money for us so that we can sleep, all thanks to APIs.”

API ecosystems helped solve the challenges associated with siloed and disparate systems in organisations. This is evident in iMuse connecting multiple internal and other external systems, and such connections ensured that the relevant data was shared without restrictions. By extending its systems, iMuse also benefits from extended revenue streams.

## 5. Discussion

This study responds to gaps in previous studies on the lack of API-related agility outcomes. Drawing on a qualitative case study of a digital music platform, the study uncovered four primary agility outcomes (Fig. 2) and the interplay between the outcomes (Fig. 3). As presented in Fig. 2, the study found that API integration produced outcomes: customer, partnering, decision, and operational agility. However, the analysis suggests that these outcomes were not achieved in a vacuum, as iMuse had to own and develop technological capabilities (e.g., IT/IS infrastructure), human competence, partnership capabilities, and financial resources. First, iMuse needed IT/IS infrastructure, such as software and hardware, that supported the organisational activities as they aided in collecting and processing data that informed decision-making [109]. Second, APIs integrate systems, but they are technical resources developed, deployed, and institutionalised by human resources, hence the need for human competence. Human capabilities like competence in API development and integration give value to APIs by defining their purpose and use. Third, iMuse needed financial capabilities to invest in technologies and other resources to improve its agility [109]. Financial resources also enable access to requisite human and technical resources (codes, training programs, etc.), facilitating API capability development. The concept of dynamic capabilities, the theory underpinning organisational agility, suggests that these resources and capabilities were necessary for enhancing iMuse’s ability to innovate, form alliances and respond to environmental demands [110]. The study reveals that such resources and competencies are critical in addressing and shaping environmental changes [50,111,112]. For instance, IT/IS infrastructure capabilities enable operational agility as they aid iMuse in streamlining its processes at various levels. Human competence is also vital in decision-making processes, as it aids in technical analysis and decision rules based on creativity, thereby supporting decision-making agility [51]. The next section provides a detailed discussion of the four main agility outcomes achieved after API integration.

### 5.1. Customer agility

Customers have unprecedented power, and they can determine the success or failure of a business. Businesses that fail to deliver on customer requirements lose customers and fold up [41]. IS research emphasises customers’ critical role as major sources of innovation [67] as they have become co-creators of innovation [45]. Customer agility specifies how firms identify and respond to customer prospects [113]. The analysis acknowledges the role of customers in the API innovation agenda. For instance, to remain in sync with its customers 24/7, iMuse developed API-enabled systems that supported customer feedback and reviews. The feedback and reviews were addressed promptly to ensure customer satisfaction. Using APIs keeps customers in the loop regarding the business process development and delivery. We found this outcome consistent with previous studies [45,109,114]. Öberg [114], for instance, contends that customers generally play a pivotal role in developing new products during the early stages. Zhou et al. [109] also noted how new products are developed based on online feedback and customer reviews.

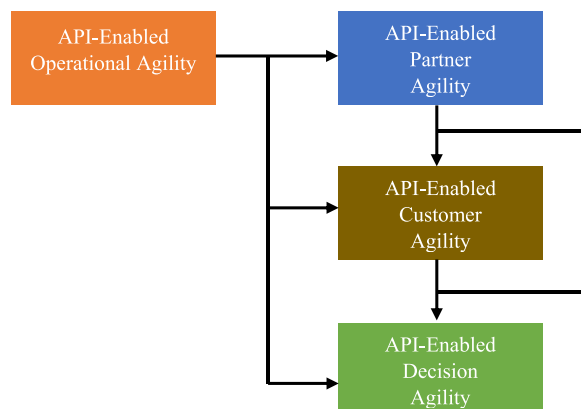


Fig. 3. Interplay of API-Enabled Agility Outcomes

As a standard practice at iMuse, customers are encouraged to recommend updates such as app features. This strategy is not surprising since global brands like eBay allow customers to share many tips on their products [115]. Through feedback and reviews via the platform, fans can communicate and recommend songs they want to be featured on the platform, and iMuse consequently reaches out to the artists of those songs. Customers also suggest their most efficient and available payment medium through the platform. Such suggestions have resulted in integrating multiple payment methods on the platform. Customers' ideas are quickly absorbed through consistent interaction and immediate implementation [116]. It is imperative to emphasise that the capabilities identified served as a resource contributing to this agility outcome. For instance, IT/IS infrastructure capabilities that support information gathering and analysis and human competence that deliver innovations and encourage loyalty are necessary for customer agility to occur. Based on these outcomes, we arrive at the following proposition.

**Proposition 1.** *API integration among digital music platforms ensures they collect real-time feedback, respond swiftly to market demands, provide personalised customer experience, and refine products and services that meet customers' needs.*

### 5.2. Partnering agility

Partnering agility specifies how organisations leverage their partners' assets and competencies (suppliers, distributors, among others) to explore innovative opportunities [45,117]. The analysis shows how iMuse built its reputation through strategic partnerships that aided in harnessing its partners' resources (e.g., payment platform) to create a platform for music lovers to purchase music while ensuring that musicians benefit from their intellectual property. Specifically, the analysis shows that iMuse partnered with TNT and other payment platform service providers through APIs. The collaboration with TNT has proven to be its biggest recently, as customers who purchased songs through the TNT network were given discounts.

Exploiting other firms' competence and capabilities has been established as an integral concept in the organisational agility literature [118]. Using the assets, resources, and competence of those in its network was a strategic move since iMuse did not have the capacity and resources to develop its payment platform. As Sambamurthy et al. [45], and Vrontis et al. [119] noted, partnering agility ensures that firms take advantage of opportunities and innovations in the partnering firm. By exhibiting flexibility, iMuse provided continuous interaction between its partners, tracking market opportunities and improving their performance [120]. The API integration also opened iMuse to several other partnerships and collaborations, facilitating information sharing and co-innovation. In all, iMuse, with its partners, navigated the difficulties of surviving alone to agree on win-win situations that address their respective needs. Prioritising API integration strategically positioned iMuse to engage partners and stakeholders within its ecosystem for value co-creation.

**Proposition 2.** *Through strategic API partnerships, digital music platforms increase their platform reach and promote joint innovation.*

### 5.3. Operational agility

Operational agility explains how organisations sense and implement identified business opportunities efficiently and cost-effectively. Operational agility also features the ability of organisations to produce new processes by redesigning their existing processes [45]. The research findings suggest that iMuse found opportunities in the problems that confronted them and instituted measures to minimise the re-occurrence of the issues, improving their business process. API integration reengineered the process of purchasing songs on the platform, as customers can buy songs in real time compared to the previous process, which took hours and days. Krotov et al. [121] acknowledge the vital role technologies like APIs play in operational agility. They argue that technologies that help to integrate business processes support operational agility. Specific operational outcomes realised through the API integration show operational cost reduction, promoting efficient and effective products and service delivery. These outcomes were achieved because APIs ensured the streamlining of iMuse's internal and external processes through various capabilities such as IT/IS infrastructure and human competence. For instance, human competence ensured a well-equipped employee workforce that quickly identified areas where iMuse needed improvement and suggested innovations that drive excellence.

**Proposition 3.** *Integrating APIs in digital music platforms supports operational efficiency, eliminates manual processes and enables seamless process optimisation.*

### 5.4. Decision agility

Over the years, decision agility has been less discussed within the IS discipline [42]. Decision agility is explained as the decision made after sensing takes place. We argue that the ability to sense an opportunity does not automatically translate into a response. Decisions are made to translate what has been perceived into meaningful responses that will impact the organisation. Decision agility is evidenced in the iMuse as every change received (mostly in feedback) is synthesised. The synthesising of user feedback is to ensure desirable feedback is considered. Like most organisations, top management makes most of the strategic decisions. However, fewer strategic decisions are left for middle-level managers, such as heads of the various units and departments. With APIs being critical IT resources and facilitating data exchange between iMuse and its customers and partners, fast and accurate decisions are made based on insights gathered. Human competence through critical thinking and problem-solving abilities [51] plays another vital role, as people at iMuse make final decisions. For instance, the CEO can monitor customer subscriptions and purchases based on geographical location and total song purchases. Consequently, they can focus more resources on places they deem fit and respond to customers' needs within

those areas. The API integration also ensured that the information from their internal systems was consolidated into comprehensible reports, translating to best action plans and improved organisational decision-making. These issues correspond with previous studies that agile firms can make quicker decisions [122]. The speed adopted to respond to such decision changes is also evidenced in past research [123].

**Proposition 4.** *Digital music platforms integrate APIs to gather timely data and analyse market and customer trends to make fast and informed decisions.*

While stressing the forms of agility, it is also imperative to highlight the tensions that arose during the API integration era. Some integrating firms exerted excessive power and control over their systems, making integrating with iMuse difficult. For instance, the findings showed how one of the firms insisted on IP endpoints, which required iMuse to possess a dedicated server. Excessive control coupled with iMuse systems compatible with only URL pinpoints halted the process. Gawer [124] contends that organisations that exercise much control over their platforms are at risk of choking generativity on their platforms as they drive away third-party developers and integrations. Generally, platforms need some control, or developers and customers see them as less useful; hence, they cannot generate the intended value [124]. Meanwhile, internal tensions, such as employee interest above the corporate goal, had to be eliminated for the organisation to reach its current status. As noted, some employees put their interests above the organisation, which sometimes derails its progress, especially initiatives involving existing and potential partners.

### 5.5. Interaction between operational, customer, partner and decision agility outcomes

Based on the findings, a model (Fig. 3) that explains the interplay between the identified API-enabled agility outcomes was developed. From the four outcomes, operational agility, which focuses on streamlining and improving iMuse's processes, can be deemed the starting point of the model on which the other outcomes thrive. iMuse's ability to streamline its processes through API integration allows it to improve responsiveness to its internal needs, thus promoting a culture of creativity and innovation [125]. Arguably, operational agility fuels the other outcomes, as it is critical to ensure that iMuse's internal processes are streamlined and the platform functions well. This indicates that internal success and outcomes are critical and can enable external success. Based on the interactions, we provide the following proposition.

**Proposition 5.** *API-driven operational agility among music platforms forms the foundational requirement facilitating partner, customer and decision agility.*

The subsequent interaction (second box) is partner agility, which appears after operational agility, suggesting the vital role of partnerships in building, driving technological innovations and expanding iMuse's reach. Partner agility relies on the successes of operational improvement to form alliances with players in its ecosystem. The findings showed how often iMuse partners with businesses within its ecosystem, such as telecommunication companies (TNT) and payment platform providers. This helped leverage the data and technologies available to drive entry into new and larger markets [126] and establish mutual benefits for stakeholders in the ecosystem.

**Proposition 6.** *An API-enabled partner agility among music platforms facilitates swift integration with third parties, promotes the quick release of customer-oriented content and enriches customer agility.*

The third outcome, customer agility, suggests a customer-centric approach to innovation at iMuse [127]. iMuse's quest to streamline and improve its operations and partner with companies within its ecosystem is to meet customers' needs; hence, this form comes after operational and partner. Organisations continuously innovate to meet customer expectations in a digital age where customers have become more sophisticated and possess evolving needs. Therefore, by integrating APIs, iMuse collects and analyses customer feedback that feeds into the platform's adaptability and delivers personalised customer content. The findings demonstrate how iMuse customises its products and services (e.g., using African symbols on the platform) to suit customers' needs. iMuse achieved this by gathering customer feedback, analysing it and developing strategies that deliver better customer experiences. Customers and users can personalise their platform experience through swift organisational response mechanisms. This development proves customers have greater control as they foster loyalty by becoming cocreators of innovation [114,128]. The fourth (and ending) outcome in the interaction is decision agility, which is realised due to the culmination and convergence of the other three agility outcomes. Decision-making at iMuse has been improved because of prompt access to real-time and accurate information made possible through API integration. iMuse's ability to collect and evaluate feedback and make swift responses enabled it to reduce the risk of service disruption. Alternatively, this approach has positioned iMuse to adapt to the industry by innovating and staying ahead of competitors, especially those in Africa. Decision agility outcomes guide most strategic and operational decision-making, as it shows iMuse's willingness to make data-driven decisions that help it to make the right decisions. The outcome at iMuse also aligns with Yue (2020), who intimated that organisational decision agility is linked to its ability to collect and analyse real-time data.

**Proposition 7.** *API-driven customer agility among music platforms contributes to great user experiences and increased customer satisfaction, critical outcomes driving decision agility.*

**Proposition 8.** *API-driven decision agility ensures continuous operational improvement that supports how music platforms adapt and respond swiftly to volatile market situations.*

It is essential to underscore the interdependencies of each outcome, creating a symbiotic relationship. This is because each outcome

somehow implies the other. For iMuse, there is a flow of information or feedback for each agility outcome. For instance, there could not have been a partner agility outcome without improving internal operational processes. Partner agility established through collaborations contributed to improved customer experiences (customer agility). Likewise, iMuse gathers data (feedback and insights) from their continuous customer interactions to make decisions. The data-driven decisions then feed back into establishing procedures for improving its operational processes. These interactions are necessary to support the continuous improvement of iMuses's processes.

## 6. Study contributions

### 6.1. Theoretical implications

Digital firms like iMuse have become integral to the larger global economy. They play critical roles in employment creation, enhancing the economy's growth, and realising a more inclusive world [70,129]. While most digital firms embrace APIs to deliver better products and services, there is a shortage of research on how agility occurs. To the best of our knowledge, this study is the first to attempt to examine the agility outcomes of API integration empirically. Based on the findings, this study offers some critical theoretical implications.

First, the study theorised the existing processes of a digital music platform that needed urgent improvements and emphasised that APIs were an essential tool in realising improved product and service delivery. Using the organisational agility lens in the study enabled us to understand the importance of APIs in detecting environmental changes through various sensing and responding mechanisms. Hitherto, most agility studies have only examined the role of digital technologies in agility [39,47,48] but not as a consequence of innovations like APIs. This study expands the discussion by examining a specific innovation (API) that iMuse leveraged to compete with global digital music platform brands such as Apple Music. This study contrasts most IT integrations in the literature, such as ERPs. The study contends that agility is required for events that firms can easily detect and those that cannot. Considering the turbulent nature of the business environment, organisations need to position themselves to rely on various forms of agility to remain competitive. The study found different agility outcomes based on various environmental and contextual changes [47,48].

The second theoretical contribution of this paper is the decomposition of the agility outcomes, as shown in Fig. 2. The aggregations from the first and second-order constructs into a concise theoretical dimension suggest the various elements underpinning the primary agility outcomes. Specifically, operational, partner, customer, and decision-making abilities help better comprehend the diverse underlying components that drive organisational agility in digital music platforms [55]. The decomposition of each agility outcome into various constituents sheds more insights into the unique mechanisms and connections that support agility. The breakdowns can help develop frameworks and models that offer better perspectives on how organisations can achieve agility as they navigate dynamic and volatile environments. Scholars can gain a better comprehension of the nuances existing between API integration and organisational agility.

Third, the findings extend knowledge related to the role of technologies such as APIs for sensing and responding. As mentioned earlier, the question of how organisations achieve agility and agility outcomes after API integration has remained unanswered. Most studies have positively impacted digital technologies, capabilities, and organisational agility [1,130]. This study adds to existing research by showing how a small digital firm's API integration contributed to achieving agility at the organisational level. We increase our understanding of the processes for achieving agility per the findings. For instance, the study showed how the API-enabled platform allowed the organisation to make better and faster decisions through up-to-date feedback from customers and partners. As supported by Chan et al. [70], the findings highlight how iMuse developed innovative capabilities (developing and integrating APIs), maintained high levels of flexibility [partnered with other organisations], and possessed imitation abilities [to become competitive] [123]. The findings further conceptualise four agility outcomes as a consequence of API integration: customer agility, partnering agility, decision agility, and operational agility. The conceptualisation addresses the lack of understanding of API integration outcomes. The study further demonstrated agility after addressing tensions and rigidities during the API integration. Such outcomes confirm previous outcomes that point to organisations' demise if they cannot overcome rigidities [47]. Specifically, organisations can improve agility by suspending legacy systems and inflexible applications [old music websites] that tend to increase rigidity [6,57].

### 6.2. Practical implications

First, it provides insights into an essential but relatively unexplored subject (APIs) and establishes an integrated outcome based on empirical data from a digital firm. The outcomes indicate how API innovations can be leveraged to address developmental matters, including those relating to the United Nations Sustainable Development Goals (UNSDG). While APIs are critical for all 17 goals, as vital catalysts for growth and prosperity, we emphasise goals 8 and 9. For goal 8, the findings have implications for decent work and economic development. APIs have become useful for integrating systems and improving efficiency while fostering innovation and economic growth. The study contributes to goal 9 on industry, innovation and infrastructure. Leveraging APIs on digital music platforms is a major innovation in the sector, and the outcomes provide best practices.

The study also reaffirms the transformative role of IS innovations in advancing people and society. The study highlights a technological innovation that a small digital firm leveraged to overcome the traditional barriers of physical music sales on CDs to running on an online digital music platform. It showed how digital music through APIs offered iMuse greater access to capital, reduced losses and errors associated with the previous system, increased platform reach and offered employment opportunities for the youth. The findings also provide valuable insights into supporting the digital transformation of small businesses as policymakers and governments can consider APIs in their transformation agenda. This has become important in the wake of the COVID-19 pandemic, which has made

most small firms vulnerable. Practitioners and policymakers can support these businesses by developing applications and systems that can easily be integrated to support their activities [131].

Furthermore, the conceptualisation of how firms achieve agility and its forms can serve as a reference for developing country firms, especially digital firms, in strategising and reengineering their operations in the face of disruption and competition. Business owners and top managers should avoid rigid business practices and adopt a more flexible mindset towards business strategies [70]. The findings could provide best practice guidelines for businesses leveraging APIs to improve agility. As evidenced in the findings, such perspectives are 1) crucial towards embracing boundary openness. 2) Adopting an open mindset ensures that organisations always seek opportunities to work with partners to integrate their systems. 3) Being flexible helps organisations respond appropriately to rigidities and tensions in organisations seeking to leverage their resources and capabilities. 4) Agility does not necessarily require an entire overhaul of an organisation's structure.

### 6.3. Limitations and future research directions

Like any other research, this study has limitations that offer future research opportunities. First, the study focused on a single case study of an emerging digital firm, which limits the generalisability of the [48] by introducing key agility outcomes. While statistical generalisability is not ideal, theoretical generalisability [132] is applicable as it helps advance theory and practice and opens new opportunities for API-related research. With large organisations possessing complex platforms, future research can investigate the role of API innovations for agility in large and different organisations. Considering how context sensitivity affects research findings [133], conducting this study in different contexts will be laudable.

Second, this study mainly focused on expected events and investigated the sensing and responding mechanisms that support such occurrences. With the emergence of the COVID-19 pandemic and the uncertainties regarding unexpected events, we propose that research investigate other forms of agility that firms can adopt in unexpected events. Specifically, significant and insightful findings should be focused on which forms of agility small and medium-sized firms in developing countries can exhibit, following Levallet and Chan's recent [48] study on improvisational agility for unexpected events. Again, we suggest researching API initiatives' economic outcomes, especially for digital startups. Another area worthy of further investigation is API innovations among government institutions within the public sector. Future studies could also focus on APIs in other IS domains, such as cloud computing. Lastly, future research can investigate the underlying mechanisms and drivers compelling small firms to develop and integrate APIs.

## 7. Conclusion

This study has demonstrated the transformative role of APIs in a digital music platform. With many organisations adopting APIs into their processes, exploring their organisational outcomes beyond the technical considerations is essential. With the previous approach of selling music on CDs, resulting in several inefficiencies, iMuse opted to leverage APIs to remain competitive. APIs became iMuse's defacto technology, enabling them to connect their applications to their partners. By reconfiguring its capabilities and resources and integrating APIs, iMuse increased its customer base, improved its processes, and eliminated errors and delays that characterised the previously manual processes. Through API integration with other systems and platforms, iMuse made data-driven decisions that propelled it to greater heights. The study demonstrates through empirical data the forms of agility outcomes and how the agility outcomes occur. The findings shed light on four specific organisational agility outcomes – operational, customer, partner, and decision agility, that can be achieved due to API integration. The findings also suggest that iMuse needed key capabilities to develop and integrate APIs, further highlighting the critical role of the underpinning theory (dynamic capability) in achieving agility. The findings of this study based on the theoretical underpinnings increase our understanding of agility concepts in the context of API integration among small digital firms.

### Data availability statement

Data supporting this study's findings are available from the corresponding author upon reasonable request.

### CRedit authorship contribution statement

**Joshua Ofoeda:** Conceptualization, Methodology, Software, Writing – review & editing, Formal Analysis, Investigation, Writing – original draft. **Richard Boateng:** Conceptualization, Supervision, Formal Analysis, Visualization. **John Effah:** Supervision, Writing – review & editing.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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