An institutional perspective on application programming interface development and integration

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Abstract

Purpose – Digital platforms increase their function and scope by leveraging boundary resources and complementary add-on products from third-party developers to interact with external entities and producers. Application Programming Interfaces (APIs) are essential boundary resources developers use to connect applications, systems and platforms. This notwithstanding, previous API studies tend to focus more on the technical dimensions, with little on the social and cultural contexts underpinning API innovations. This study relies on the new (neo) institutional theory (focusing on regulative, normative and cultural-cognitive pillars) as an analytical lens to understand the institutional forces that affect API integration among digital firms.

Design/methodology/approach – The study adopts a qualitative case study methodology and relies on phone calls and a semi-structured in-depth interview approach of a Ghanaian digital music platform to uncover the institutional forces affecting API integration.

Findings – The findings reveal that regulative institutions such as excessive tax regimes mostly constrained API development and integration initiatives. However, other regulative institutions like the government digitalization agenda enabled API integration. Normative institutions, such as the growing use of e-payment options, enabled API integration in digital music platforms. Cultural-cognitive institutions like employee ego constrained the API integration process in music digital platforms.

Originality/value – This study primarily contributes to deepening understanding of the relevant literature by exploring the institutional forces that affect API integration among digital firms in a developing economy. The study also uncovered a new form of an institution known as motivational institution as an enabler for API development and integration in digital music platforms.

Keywords API, Institutional forces, Development, Integration, Socio-technical, Software

Paper type Research paper

1. Introduction

Digital platforms bring together producers and customers by providing an infrastructure that reduces transaction, distribution and search costs, thus creating value for all parties (Pagani, 2013). Digital platforms increase their scope and functionality by leveraging third-party developers' boundary resources [e.g. application programming interfaces (APIs)] and complementary add-on products (Eisenmann *et al.*, 2006). Boundary resource decisions generally relate to the interface design and how it helps connect other systems (Ghazawneh and Henfridsson, 2010; Gawer, 2020). Most businesses rely on boundary resources such as APIs to make their services available 24/7 and add customized applications (Vithayathil, 2018). As drivers of innovation and enablers of contemporary digital ecosystems (Jansen *et al.*, 2013; Jansen and Cusumano, 2013), APIs enable firms to reach new customers through third-party applications. This phenomenon allows them to use their IT resources best, help create user experiences and open their data to organizations within their ecosystems, creating a win-win situation for all parties (Pettey, 2016). For instance, Netflix's Amazon web APIs benefited both companies because the more popular Netflix becomes, the more money Amazon makes due to the increase in its API use. This API phenomenon has spurred significant enthusiasm from scholars and practitioners. ProgrammableWeb, arguably the

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largest public API directory, suggests more than 24,000 public APIs on the web (Simpson, 2022).

Despite being vital boundary resources, APIs are less explored in the Information Systems (IS) platform literature (Gawer, 2020). IS research broadly focuses on digital platforms as part of the most important phenomena in understanding digital innovation (Foerderer *et al.*, 2018) with less focus on APIs, which provide the connective tissue developers need to connect systems and platforms (Thomchick, 2018). The platform literature has not explicitly explored platform boundary resource issues (Pujadas *et al.*, 2020). Specifically, the existing literature on APIs has focused on the technical aspects, mainly programming, security, usage patterns and calls (Qiu *et al.*, 2016; Santos *et al.*, 2016; Kula *et al.*, 2018). Because of this, API research is dominant in computer science and technical IS journals (Santos *et al.*, 2016; Santos and Myers, 2017), with little evidence in the mainstream IS literature (Wulf and Blohm, 2020; Gawer, 2020).

Furthermore, existing studies have not adequately addressed the issues of institutional safeguards, structures, assurances and values affecting API development and integration (Sambamurthy and Jarvenpaa, 2002). Specifically, besides the dominant technical focus on API research, there is less focus on how social and cultural systems shape the development and integration of APIs (Shatnawi *et al.*, 2016). We argue that such minimum focus emerges perhaps because many organizations perceive APIs as mere technological tools. However, Eaton *et al.* (2015) contend that APIs should not be perceived as mere software tools but as a complex socio-technical assemblage of many actors with different technological needs (Pujadas *et al.*, 2020). The social dimensions are influential and integral factors in implementing various technological initiatives. API developers and users face social and cultural issues within specific contexts, and there is a need to understand these issues (Hsu *et al.*, 2012; Effah, 2016). APIs form an integral social system that forms the technological landscape. For instance, the role of people in API development and integration can have an economic and social impact on the organization, which goes beyond the technical dimension, as past research has emphasized. Besides, as technical tools, people develop, integrate and maintain APIs, giving rise to other social issues as they undertake these activities. Thus, a holistic understanding of APIs is better approached from the socio-technical rather than the technical perspective. These social and cultural issues influence organizations and people as information flow is often closely intertwined with culture and other social issues (Leidner and Kayworth, 2006).

Ongoing research, especially in open innovations such as APIs, suggests overcoming challenges, especially cultural, cognitive, organizational and institutional differences between collective partners (Baldwin and Von Hippel, 2011; Bednar and Welch, 2020). Businesses operate within socio-cultural environments in institutional complexities shaped by multiple actors at different levels with different logics (Senyo *et al.*, 2022b). API development and integration occur within organizations with different actors and understandings. Thus, to understand the institutional forces affecting the API development process, we move away from the predominant technical API research to accommodate other social dimensions that bring together multiple actors. We submit that the institutional concept provides an alternative to technical determinism and a new view of social and cultural transformation potential through technology use like APIs. The new institutional theory offers a basis for understanding the contextual, social and cultural differences affecting innovation adoption in various socio-organizational contexts (Avgerou, 1996; Heeks, 2002). This is vital because IS innovations must have potential value and fit well in the local social-organizational conditions in which they are used (Avgerou, 2001). As Avgerou (2003) noted, IS innovations must not be confined to design actions but, more importantly, organizational structure and work activity changes. Ghana, a developing country in West Africa, was chosen because it has great prospects for digital innovation. According to the World Bank, digital is one of the most booming sectors in Ghana, with

Ghana among the digital leaders within the Sub-Saharan regions of Africa (World Bank, 2022a). The successes emphasize the emergence of small organizations that have begun developing and integrating APIs in-house to address their digital needs. Nonetheless, Africa generally lacks API research representation (IFC, 2020). Considering this, this study further addresses a call by Eaton *et al.* (2015) on the need for research to focus on API research within specific industry settings like Ghana.

Against this backdrop, the research question that this study addresses is: what institutional forces affect (constrain or enable) API integration among digital music platform organizations? Due to the vastness and diverse application of the new institutional theory (neo-institutional theory), we focused on the three pillars (regulative, normative and cultural-cognitive) (Scott, 2014) to address the research question. We undertake a qualitative case study on a Ghanaian digital platform provider to answer the research question by interviewing multiple participants. Our inductive data analysis revealed that varied institutional forces affected API integration. Our findings identified pillars of the new institutional theory with various elements. An emerging institution (motivational institution) became a new element emerging from the new institutional theory as an enabling force for API integration. The study offers a unique theoretical explanation of API integration at the organizational level. It provides insights into institutional roles in API development and integration and contributes to the scholarly discussion of socio-technical IS (Wulf and Blohm, 2017). Our study also contributes to the ongoing debate on how innovations address digital firms' needs and contribute to societal change and economic development (Qureshi *et al.*, 2021). An aspect of the theoretical problem that this study addresses is how small digital firms develop and integrate APIs, which deviates from what we know from big and incumbent technology firms such as those in the fintech space that leverage APIs (Hino and Fahey, 2019).

Following the introduction, we focus on research in digital platforms and APIs. Section 3 discusses the study's theoretical background. The research methodology is covered in section 4, which details the case description and the procedure for gathering and analyzing the research data. In sections 5 and 6, we present the research findings and discussions. Further, we present the theoretical and practical implications of the study and the conclusion.

2. Literature review

2.1 Digital platforms ecosystems

Digital platforms fuel innovation and change and help organizations create value and succeed (Tantalo and Priem, 2016). The volatility of the business environment suggests organizations must continuously innovate to discourage competitors from entering their market (Suseno *et al.*, 2018). Like biological organisms occupying an environment and interacting with each other, businesses today rely on technology to interact. Moore (1993) contends that organizations cannot be viewed as single businesses but as belonging to a business ecosystem that spans several industries. Businesses cannot operate as islands and think about evolving in a vacuum. They are expected to create new networks by attracting enough capital, customers and suppliers (Moore, 1993; Pilinkienė and Mačiulis, 2014). Following this, businesses can create value by facilitating the exchange of goods and services between groups depending on each other. Platform ecosystems connect two or more sides, creating a powerful network effect. Facebook, Google and Amazon have become powerful as more members are added and participate in the network. By opening up their interfaces, these firms drive co-opetition (Altman and Tushman, 2017). Despite these benefits, digital platforms possess disruptive potential caused by distinct designs and configurations in market environments (Christensen *et al.*, 2015). For instance, the taxi industry is being disrupted due to the influx of platforms such as Uber. Digital platforms face other infrastructure development and connectivity challenges, especially in developing economies

like Africa. Amid the challenges, developing economies continue to leverage digital platforms for employment and growth (Lee, 2016).

But, despite the attention digital platforms have received, it is worth noting that APIs are the essential elements that drive most of these digital platforms and ecosystems. APIs are leveraged at various levels to access a digital platform's core services. APIs have become the "fabric of connecting ecosystems of organizations and individuals" (Berman and Marshall, 2014, p. 15), and sometimes their competitors. Due to their importance for business transformation, studies have shown that firms without APIs that allow their software to interface with each other are tantamount to the Internet without the World Wide Web (Lyer and Subramaniam, 2015).

2.2 Application programming interfaces (APIs)

APIs enable developers to access already-implemented and tested software and support software reuse (Frakes and Kang, 2005; Shatnawi *et al.*, 2016). This approach helps increase software quality by reducing programmers' efforts in coding, testing and maintaining software (Shatnawi *et al.*, 2016). APIs have become crucial to software developers because developing software and APIs have become inseparable activities (Santos and Myers, 2017). Platform owners continually rely on APIs as critical resources to access external developers and create value from their platform-complementary innovations (Gawer, 2014). Though invincible to end-users, APIs are uniquely essential digital platform interfaces that help software developers save time and money and simplify their application development. APIs are made available to developers through Software Development Kits (SDKs), helping streamline application development. Platform firms open their APIs by sharing instructions on connecting complementary innovations, increasing the complementor's development and extending their platform's functionality (Gawer, 2020).

From a broader perspective, APIs constitute the foundation of connecting ecosystems of organizations and individuals (Berman and Marshall, 2014) as they provide the technical specifications that enable the interaction and integration of systems and organizations. Diverse categories of APIs exist for developers: internal APIs, public APIs and partner APIs. Google Maps API, for instance, allows independent software developers to display and incorporate Google Maps into their platform-complementary innovations for specific regions and calculate distances between two locations (Gawer, 2014; Espinha *et al.*, 2015).

In the platform literature, APIs are primarily mentioned as the interfaces between the platform core and their complementors, extending the platform into new and broader markets (Iyer and Subramaniam, 2015; Wulf and Blohm, 2017). For instance, the 2007 alliance between Facebook and Zynga saw Facebook (the platform provider) open its platform to Zynga (complementor) through APIs (Iyer and Wyner, 2012). Digital platforms create interactions between customers and their external producers (Hein *et al.*, 2020). The emergence of various social media platforms, such as Facebook, has revolutionized connection to family and friends. Peer-to-peer digital platforms like Uber have also strengthened the sharing economy. Different payment platforms like PayPal also ushered in effective and efficient ways by which we can make online payments, thus, giving rise to e-commerce (de Reuver *et al.*, 2018). The emergence of the on-demand economy (Gig Economy), which is driven by digital platforms, is changing the nature of work and shaping the labor market (Tan *et al.*, 2021).

2.3 APIs as socio-technical systems

In the past, decisions on APIs have largely been a reserve of the Information Technology department as they were regarded as technical solutions. However, considering how vital they have become, they are being discussed by business leaders in boardrooms to address various business needs (Boyd, 2017). We argue that shifting API issues and decisions from the technical

domain to the organizational, business and managerial levels suggest a mix between the technical and business (social) dimensions. Our position is grounded on an earlier argument by Avgerou (2003), which indicates that, for businesses to survive, they should adopt approaches that recognize the interactions between people and workplace technologies. Critically, the subsystems, grounded in social constructionist and structuration analysis, suggest three elements for understanding socio-technical processes (Walsham, 1993; Orlikowski, 2000). The first is the organization's culture and structure, which focuses on the institutionalized ways of doing things. The second focuses on actors' actions and initiatives to use technical capabilities to perform their roles. The last element is the material and structural characteristics of the technology used (it details the technology's technical features that enable and constrain certain organizational conditions) (Avgerou, 2003). In achieving a better outcome, there must be a fit between the technical and social subsystems. Critically, these subsystems make up the organization and have become inseparable. Technologies cannot make sense independently; people make sense of workplace technologies (Avgerou, 2003). A socio-technical view of APIs helps explain how they are developed, integrated and used while exploring the social and technological issues affecting them (Lea *et al.*, 1999; Avgerou, 2003).

For socio-technical systems to thrive, we need to have a process that involves innovators (e.g. API developers) and recipients (API users) that deal with complex and evolving artifacts (e.g. API products) (Mumford, 2006). It is impossible to decouple the social, cultural, individual and organizational knowledge and experiences (Bednar and Welch, 2017). In this approach, we cannot ignore the participation of human beings whose skills and contextual understanding are needed to achieve the system's purpose (Bednar and Welch, 2020). According to Luna-Reyes *et al.* (2005), the social and cultural approach to IS does not entirely neglect technology; but also emphasizes how technology can transform people and enterprises. This approach emphasizes that besides the hardware and software components, people, work processes and institutional and cultural forces are part of a more complex socio-technical collaboration that enables things to work in organizations (Luna-Reyes *et al.*, 2005; Ofoeda and Boateng, 2018). The socio-technical perspective also ensures we understand the working practices associated with APIs and the roles and responsibilities of people associated with API innovations. Early works present IT as symbolic and subject it to various cultural interpretations of the people who use it. Such views and interpretations have become alternatives to the predominant technical determinism of IS research and further support the potential cultural transformation in the use of technology (Coombs *et al.*, 1992; cited in Bednar and Welch, 2020).

In merging the issues, it is vital to underscore that emerging economies like Africa are becoming a growth market as it has a young population with increasing mobile penetration. Despite these prospects, there is still much to be desired as challenges persist (Chakravorti and Chaturvedi, 2019). For instance, there seems to remain a continuous over-reliance on imported technologies by emerging economy firms, neglecting the different cultures and institutions and how they shape people's behavior. This has inhibited technological advancement efforts in Africa for years (Fabayo, 1996). Avgerou (2001) and Heeks (2002), therefore, caution against the direct transfer of technological experiences from developed to developing economies due to contextual differences and social habits (Ofoeda *et al.*, 2018). While acknowledging that APIs have become a global phenomenon, contextual issues could affect their deployment as their evolution has been shaped mainly by technological, social, cultural and political factors (Sanz and Crosbie, 2016).

2.4 The context of API development and integration

The role of context in the integration of API cannot be overlooked. Context is "the set of factors surrounding a phenomenon that exert some direct or indirect influence on it"

(Whetten, 2009, p. 31). Understanding the context is vital because technology artifacts like APIs have context specificity, meaning no single conceptualization of technology will work for all usage contexts (Orlikowski and Iacono, 2001). In other words, how an API is integrated may differ from one contextual setting to another. Consequently, we are interested in understanding the forces that directly or indirectly affect API integration because, over time, these factors create a culture from which institutions emerge. Three contextual components must be examined, i.e. technology, usage and users (Hong *et al.*, 2014). These components were examined vis-à-vis the focal contextual setting, Ghana, a low-middle-income country in West Africa. Ghana is ideal for understanding the institutions surrounding API development and integration because there is a growing interest in digitalizing the country's economy, as it forms the current government's main agenda. Through Ghana's Ministry of Communication, the Digital Ghana plan seeks to digitize services such as mobile money interoperability, biometric identity and digital property addressing systems (NCA, 2018).

First, the technology component refers to the technology artefact under study, including its capabilities and functionalities, i.e. API services. Many forces can shape the design and integration of these technologies and can influence how users perform various tasks. As APIs combine multiple digital communication services (Ofoeda *et al.*, 2019), Ghana's digital entrepreneurs have begun leveraging APIs to communicate with other systems. Second, usage refers to the users' utilization of the technology artefact under study. The level of technology usage largely determines its impact on individuals and the organization. Ghana is experiencing an increasing adoption and use of mobile money services in Ghana which are supported by APIs. A recent World Bank report recognizes Ghana as Africa's fastest-growing mobile money market (Collins, 2021). With APIs becoming integral to fintech and the entire digital ecosystem, it is imperative to understand what institutional concepts shape how firms use APIs vis-à-vis the integration. Third, users refer to consumers of API-based services, which are the systems or devices APIs access resources from (Fanchi, 2022). In this context, the users (i.e. iMuse) use the technology (APIs) based on identified needs and motivations. Other users include those who use the iMuse app to purchase a song using diverse online payment platforms.

The need for increasing context-sensitive research has been well established (Whetten, 2009). This is after studies have highlighted how contextual issues were underappreciated and unrecognized (Johns, 2006). The growing API economy in Africa propels telecommunication companies to allow startups to connect their APIs to improve services and build new products (Okunola, 2018). As a result, mobile money, billing, messaging and billing APIs have become the most dominant and suitable local operator APIs for most African startups (Bayen, 2016). Despite this growth, telecommunication companies are mostly not forthcoming for many entrepreneurs, especially when they need to connect with their APIs. There have been high charges from telecommunication companies, which many startups believe hinders regional innovation (Okunola, 2018). However, recent reports suggest that some telecommunication companies have begun opening their platforms to third parties. For instance, Ericsson and MTN's partnership ensures that developers freely access MTN's software platform (Ericsson, 2019). Within the Ghanaian context, complex interactions exist for organizations to develop and integrate innovations. For instance, the internal environment, innovation culture and managerial style are integral in integrating innovations in Ghana (Dansoh *et al.*, 2017).

There have been previous attempts to import working cultures into the Ghanaian context, most of which were based on Western ideas. Most of these cultures failed because they did not fit well in the Ghanaian culture (Haruna, 2003). Similarly, as innovations such as APIs evolve and become key for most African businesses, it is vital to understand the unique cultural issues relating to employees and their working conditions and how they influence API integration. For instance, some studies suggested that workplaces should be flexible enough to accommodate these cultural values. Specifically, employees who value their families

should be permitted to attend to emergency family matters while at work (Mensah, 2019). These cultural and societal values are entrenched in Ghanaian society and are held firmly among employees and their employees and such values may differ across other contexts, particularly Western cultures. Other issues relating to the Ghanaian context include growing concern about how Ghanaians and Africans fear innovations because of the uncertainties that come with such innovations (Adesida *et al.*, 2021).

In summary, since most APIs involve third-party integrations, the context in which the integration and use occur is crucial. The foregoing contextual factors have the potential to generate working behaviors which become institutionalized over time and can affect the development and integration of APIs. Unfortunately, previous research has not adequately addressed these contextual and institutional issues when integrating APIs (Shatnawi *et al.*, 2016). The new institutional theory we discuss next helps explain how an organization's formal and informal institutions affect API integration. The theory provides insights into how a developing country's digital firm navigates various institutional pressures and limitations as it integrates APIs to address its challenges.

3. Theoretical background

This study adopts the new institutional theory as the theoretical lens (DiMaggio and Powell, 1983; Scott, 2001). The new (or new) institutional theory, the later development of the popular institutional theory (Lahat, 2020), explains socio-cultural occurrences in organizational contexts (Butler, 2003; Baptista, 2009; Krell *et al.*, 2016) and understanding what institutional forces act to construct an organization socially (Scott, 1995). The theory suggests that institutions are vital in social and political life because they give meaning to various social behavior (Scott, 1995; Miles, 2012; Lahat, 2020). It is, therefore, essential to examine the effects of institutions on individuals and organizations because of their stability (Lahat, 2020). Institutions are socially constructed and achieve high resilience, giving organizations or individuals directions while controlling and constraining them (Scott, 2008; Mignerat and Rivard, 2009; Macfarlane *et al.*, 2013). Institutions could also refer to the values, norms and rules that shape people's behavior in an organization. Some institutions include ethics, culture, regulations, customs and laws (Miles, 2012). The institutional concept used in the theory also suggests things that have to do with institutions or their traits. It considers the procedures and structures that help to create, preserve, uphold or change institutional norms and practices (Scott, 2014). Therefore, institutional theory examines the link between institutions (how they shape behavior) and their broader institutional context. For organizations and individuals to be recognized and ensure their long-term existence, they seek to gain legitimacy, which is a fundamental assumption of the institutional theory (Mignerat and Rivard, 2009).

IS studies over the years have adopted the new institutional theory to examine IS/IT phenomenon because of its influencing forces (Mignerat and Rivard, 2009). Social behaviors affect the use of IS and, therefore, crucial to study the social attributes of IS phenomenon, such as IS implementation (Butler, 2003), adoption and use (Teo *et al.*, 2003), maintenance (Vial and Rivard, 2016; Krell *et al.*, 2016) and consequences (Orlikowski and Barley, 2001). In line with this, Scott (2001) perceives organizations as more social and cultural than production systems. Scott (2001) further suggests that institutions are made up of "normative, cultural-cognitive, and regulative elements that, together with associated activities and resources, provide stability and meaning to social life." Therefore, institutions are recognized socio-cultural and legal practices that shape and guide individual and organizational behavior in each social context (Avgerou, 2000). Thus, we see the materialization of institutions emerging from practices, rules and social norms (Vial and Rivard, 2016; Ofoeda and Boateng, 2018). Most institutional practices have evolved and have become institutionalized due to influences from people, interests and actions (Kostova, 1999; Vial and Rivard, 2016).

Scott (2008) presented three vital theory elements aligning with these positions: regulative, normative and cultural-cognitive institutions. Scott (2001, p 49) avers that these pillars are "the building blocks of institutional structures, providing the elastic fiber that resists change." Regulative institutions determine legal actions in a social context (Scott, 2001). Regulative institutions are established laws and regulations which define sanctions against those who act contrary to the established laws and regulations (Vial and Rivard, 2016). In this study, regulative institutions are rules, acts and policies that guide API development and integration. Normative institutions refer to the prevailing norms and values in particular social contexts (Vial and Rivard, 2016). They specify ideas and values that an organization rejects or accepts. Normative institutions also go beyond an organization's ethical principles and suggest rules that determine legitimate actions (Effah, 2016, Ofoeda and Boateng, 2018). As used in this study, normative institutions exemplify the organization's acceptable practices and traditions that indicate the socio-technical and economic environment in which APIs are developed and integrated. The third element is the cultural-cognitive institutions. The cultural-cognitive institution is "ascertained by the comparative stability, legitimacy, and power of common understanding rarely formulated explicitly" (Zucker, 1977; Baptista, 2009). Legitimacy, in this sense, refers to the degree to which internal and external stakeholders acknowledge and accept an organization's activities (Kostova *et al.*, 2008; Miles, 2012). Baptista (2009, p 308) suggests that "cognition prevails over the other pillars because people treat cultural categories as the cognitive containers in which social interests are defined, negotiated, argued, and classified." Therefore, Baptista's assertion indicates that behavior is driven more by plans in people's minds rather than laws and values (Baptista, 2009; Heikkilä, 2013). Cognitive institutions also refer to the "taken-for-granted" customs and traditions that control sense-making and decision-making (Effah, 2016). This study's cognitive institution includes organizations' thinking, behavior and decision-making patterns influencing API development and integration.

The three elements of the theory are primarily for investigative purposes but could overlap in practice (Scott, 2001, 2008). The new institutional theory is useful because it explains how various social structures shape actions and interactions (Scott, 2008, 2011, 2014). This is because developing and integrating innovations, such as APIs, are influenced by human and cultural forces (Muñoz-Flores and Olivella-Nadal, 2021). Also, the choice of the new institutional theory was guided by the suggestion by Weerakkody *et al.* (2009) for more research that adopts the new institutional theory to investigate new ideas, such as open innovations. Again, the theory's applicability can be demonstrated in how it relates IS innovations to environmental and organizational contexts (Avgerou, 2000). Despite underpinning various IS innovation studies and social context, it is currently unknown whether it has been used to comprehend specific innovations such as APIs.

To sum up, the new institutional theory guides and provides the most suitable theoretical lens to understand the social and organizational issues present at iMuse. The institutional theory also allowed us to understand better the data and the open coding approach (see section 4.4) in grounded theory (Pistilli *et al.*, 2014). Most importantly, the institutional theory provides a theoretical perspective ideal for unraveling the fundamental social structures in the form of regulative, normative and cognitive processes (Scott, 2008, 2014) shaping API development and integration. Integrating these approaches enriches the study's analysis as it better explains how institutional forces affect the identified patterns and themes in the data.

4. Research methodology

We adopted qualitative research as we consider it suitable for examining in real life the current phenomenon (Andersen and Wagtmann, 2004) and studying people in their natural setting (Denzin and Lincoln, 2007). With its roots in social sciences, qualitative methods help

examine social and cultural phenomenon as it allows researchers to understand people and the social and cultural contexts within which they live (Myers and Avison, 2002, p. 15). We relied on a single-case study to provide an in-depth and holistic understanding of the study participants (Yin, 2013). Case studies help understand the problem being studied and ensure that data is collected from a small number of subjects using multiple data collection methods (Gable, 1994; Yin, 2013). Advocates of case studies contend that case studies help to understand the complexity and nature of processes in an IS setting (Benbasat *et al.*, 1987; Yin, 2013). Single-case studies are best suited for investigating "phenomena under unique or rare circumstances" (Takahashi and Araujo, 2020, p. 105). Yin (1984) suggested single-case suitability in revelatory studies; thus, situations that had not been subjected to previous scientific research and extreme or unique cases (in this case, API research from a socio-technical perspective). Single-case studies are also at the outset of generating new theories and provide context-specific insights into phenomena (Benbasat *et al.*, 1987). Dyer and Wilkins (1991) contend the depth of the case matters and not the number of cases contributing to the theory. In this case, the priority is getting closer to the setting for the study and interpreting it (Dyer and Wilkins, 1991; Takahashi and Araujo, 2020). Ultimately, single cases afford a rich examination of the complexities and nuances of the subject under study (APIs and their institutional forces). As discussed in sections 1 and 2.4, the unique Ghanaian context supports the need for a single case as it seeks to unravel the institutional issues in a Ghanaian digital music platform positioned to compete globally. Since our study involves unraveling the institutional issues of a digital platform and following the research question (Benbasat *et al.*, 1987), the unit of analysis was iMuse's digital music platform. The unit of analysis in a study is the smallest unit needed to investigate a phenomenon and defines what is being studied (Matusov, 2007). In this study, the small unit to illustrate the institutional forces that enable or constrain API development in a platform is the digital platform itself.

4.1 Research setting

The setting for this research is Ghana, a low-middle-income country in West Africa. Ghana is ideal for understanding the issues under investigation in the following ways. First, there is a growing interest in digitalizing the economy, an agenda spearheaded by the current government. The Digital Ghana plan through Ghana's Ministry of Communication is digitalizing key national processes such as mobile money interoperability, biometric identity and digital property addressing system, which will benefit Ghanaian society (NCA, 2018). As one of Ghana's key performing sectors, the World Bank supported this initiative with $200 million to strengthen Ghana's digital ecosystem (World Bank, 2022a). Second, there is an emergence of digital entrepreneurs in Ghana. Considering the high unemployment in Ghana, citizens are venturing into building businesses driven by digital technologies. Third, there is an increasing adoption of mobile money services in Ghana. A recent World Bank report recognizes Ghana as Africa's fastest-growing mobile money market (Collins, 2021). With APIs becoming integral to fintech and the entire digital ecosystem, it is imperative to understand what institutional forces shape API integration among businesses, especially in small digital firms.

4.2 Data collection

Prior to the main data collection, we conducted an initial data collection in 2017, which aided in comprehending the context of the study and the dynamics of the API phenomenon. This initial exploration gave us first-hand insights from the field and helped refine the study's focus. Further, the initial access to the field helped shape our research and interview questions (Moser and Korstjens, 2018; Busetto *et al.*, 2020). The understanding of the context guided the main data collection process. The main data collection took place between June

and December 2019 and another set between January and February 2020. We collected data from participants through formal semi-structured interviews. We used phone calls and emails when we needed clarifications from the participants. We focused our interview questions on how APIs have shaped their business processes and the conditions that shape API development and integration. Most of the interview sessions lasted approximately 40 min to about 2 h. The number of interview participants was 10, which, according to Hennink and Kaiser (2022), is ideal for qualitative research. The participants were strategically selected based on their knowledge of APIs. We relied on a strategic case selection rather than a statistical selection (de Vaus, 2001; Boateng, 2016) because it allowed us to select a case that validly explains the research prepositions (Glaser and Strauss, 1999). In the initial round of interviews, we interviewed the chief executive officer (CEO) and platform owner and selected content developers who were instrumental during the platform's development. They possessed firsthand information that we needed to understand the objectives of the platform, its vision, features and challenges. It also allowed asking questions relating to the business dimensions of APIs. Other rounds of interviews focused on the manager of innovations services, content developers and business managers. Key participants, such as the CEO, were interviewed on subsequent rounds when we needed more information. With the lived experiences, the questions posed related to their experiences with APIs and the forces that enable or constrain the development and integration process. We collected publicly available data, such as yearly and media reports (Chanias *et al.*, 2019). The qualitative data collected were transcribed, coded and validated by all the researchers and participants. Table 1 presents the units and roles of the study participants.

4.3 Case background

iMuse (pseudonym) is a digital music firm making a significant impact in Ghana and Africa. Realizing the enormous opportunities in the technology space, the CEO of iMuse, developed a digital platform connecting musicians and customers. The motivation for this initiative was to help better the lives of musicians, as most of them did not benefit fully from their art. Hitherto, most Ghanaian musicians could not receive economic value for their creative works and depend on donations and charity when they retire from active work (DailyGuide, 2017). The need for artists to benefit from their intellectual property and make music purchases efficient, less cumbersome and at a reduced cost became critical. The platform was also created to minimize the rate of music pirating, which has become predominant in most African countries (Searcey, 2017). Compared to other platforms like Spotify, the iMuse platform was developed solely for African musicians. The platform focuses on only African

Table 1. The interview participants

Role	Years of experience	Number of interviews	Round of interviews
Developer/Marketing/Branding	6	1	Round 3
CEO and platform owner	5	3	Rounds 1, 2 and 3
Content developer 1	7	2	Rounds 1 and 3
Business development manager	8	2	Round 2 and 3
Manager, innovations services	7	1	Round 2
IT support staff	2	1	Round 3
Content developer 2	3	2	Rounds 2 and 3
Content developer 3	4	1	Round 3
Web developer	3	2	Round 2 and 3
Music lover	NA	1	Round 3
Total		20	

Source(s): Authors' own creation

music genres such as highlife, hiplife, Afropop, reggae and gospel. The platform has over 50,000 subscribers and is poised to compete with notable brands like Apple Music and Tidal. To reach its target of getting more subscribers, the firm recently partnered with a leading telecommunication giant in Ghana, encouraging music lovers to register with the telecommunication organization to access their mobile money service to buy songs on the platform. The platform recorded more than 2.3 million hits in Ghana and the African diaspora during data collection.

Before developing the platform, iMuse initially sold music on CDs. Customers were required to select their preferred song from its website. After the selection, customers were given account numbers through which they paid for the songs. Once the customers make payment, they contact iMuse for confirmation, after which the amount paid is deposited in their online account. The customer's selected songs are then burned on CDs for delivery. This existing transaction approach limited the organization in many ways. For instance, business comes to a total standstill once employees close for the day. Other challenges include low productivity, transaction errors, late product delivery and defective CDs. These challenges propelled the firm to develop and launch its digital music platform. The entrepreneur and platform owner capitalized on the increase in mobile and online service usage in Ghana to build the platform. iMuse partnered and integrated its platform with existing payment platforms using APIs to increase its reach since it could not develop its payment platform.

Besides the music platform, iMuse also rendered other services, such as the sales of advertising space for digital screens and online tickets for events such as music concerts. The digital screens were installed in taxis and had several advertising spaces for sale. The online ticket system provided a platform for event organizers to sell their tickets to event patrons more conveniently. Online ticketing was introduced to curb theft and stampedes at event centers. While these other two modules were doing well, the online platform was iMuse's biggest and most profitable endeavor.

4.4 Data analysis

This study follows the open, axial and selective coding techniques (Corbin and Strauss, 1990) to perform the analysis. Although linked to the grounded theory method, open, axial and selective coding is used to analyze the data (Eaves, 2001; Neuman, 2007). Goulding (2002) suggested that grounded theory analysis focuses on analyzing data using the grounded theory method. This approach aided in investigating patterns and relationships in the data through its organization and examination (Neuman, 2005). This analytic approach ensured we achieved qualitative rigor and overcame the challenges of analyzing huge unstructured qualitative data. The strategy also becomes valuable in developing or refining new concepts, examining relationships (Neuman, 2005), reaching theoretical saturation and generating theory in new technology and organizational settings (Urquhart, 2016; Senyo *et al.*, 2022a). Though grounded theory analysis is approached in overlapping ways in the IS domain, the open, axial and selective coding technique has become ideal in theorization and analysis is grounded in the data (Urquhart, 2016; Senyo *et al.*, 2022a). As Chun *et al.* (2019) put it, the grounded theory approach suits situations with little knowledge or enquiry (in this case, API from a socio-technical perspective). The grounded theory analysis helps identify new concepts, patterns and themes from the data (Pistilli *et al.*, 2014). This is because of grounded theory's flexibility and how it can be used as a method of inquiry besides being used as a resultant product of that enquiry (Charmaz, 2005; Bryant and Charmaz, 2007; Chun *et al.*, 2019).

The first step to achieving this is to perform open coding, which involves breaking and naming the qualitative interview data into more distinct forms (Miles *et al.*, 2013; Tzeng, 2018). The coding ensures we reduce the data without losing the meaning and elicit initial codes. This first step also ensured that we identified themes at the various levels of the data.

Examples of open coding generated from the interview data include "law and compliance directives" and "government digitalization agenda." The main output of the first step is the first-order codes generated, which offered descriptive labels for the issues of the role of institutions in the case organizations. The second step involved axial coding, a recursive and iterative process that combined similar first-order codes into an abstractive second-order construct (Strauss and Corbin, 1998; Tzeng, 2018). We managed the volume of data and created coherent structures captured under a broader umbrella using axial coding (Charmaz and Mitchell, 2001). We analyzed the first-order categories by mapping, integrating and refining the concepts into a more theoretically interesting category, resulting in the second-order concepts (Gioia *et al.*, 2013; Senyo *et al.*, 2022b). For instance, "government digitalization agenda" and "laws and compliance" all pointed to the "legal framework" operating in the context. Step three, the final stage, consisted of selective coding that drove aggregate theoretical dimensions from the second-order constructs. It involved generating the core categories that constituted the theme of this study (Benaquisto, 2008). For instance, "legal framework" and "operational" are pulled together to form regulative institutions. These aggregations helped identify the institutional theory's pillars, including regulative, normative and cultural cognitive. However, an aggregation of other second-order constructs showed the emergence of a new institution called the "motivational institution." Figure 1 summarizes the procedure for our analysis and the resulting data structure.

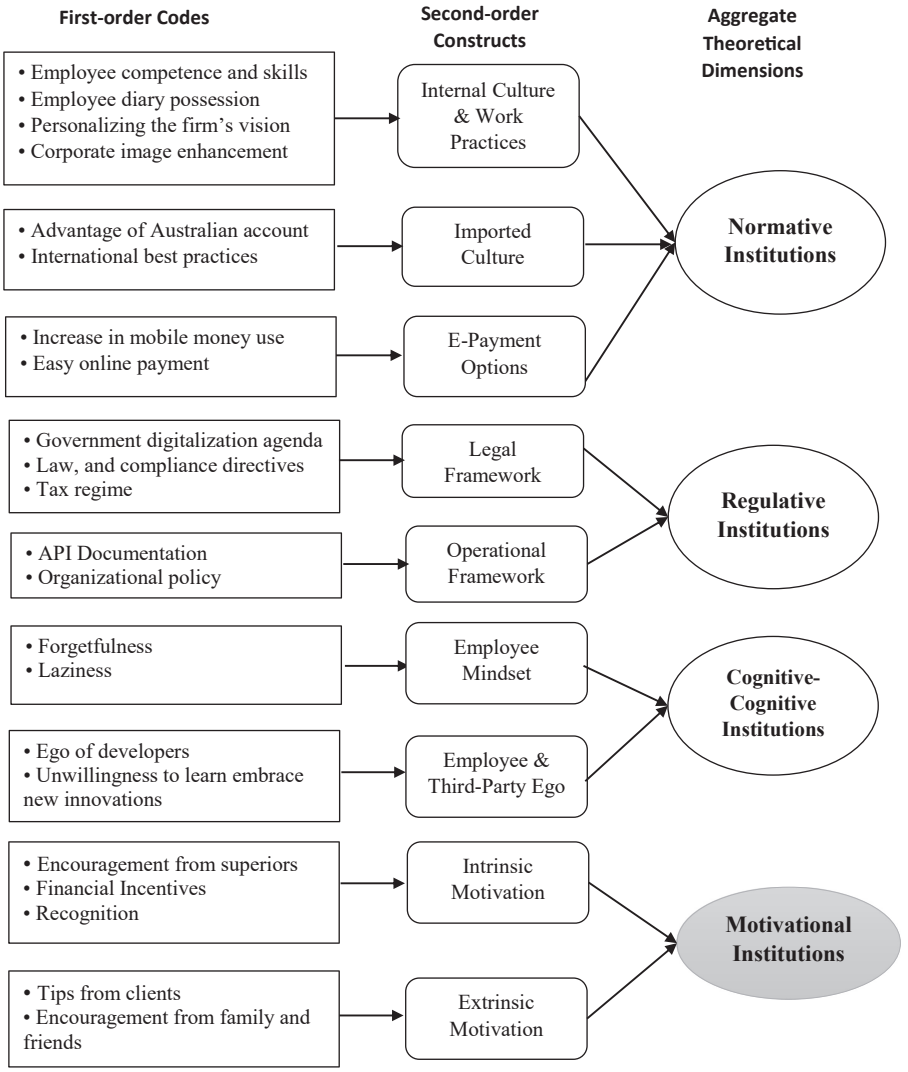
The data analysis as described has largely been impacted by our literature review, in which we identified research gaps which informed the crafting of our research problem (section 1). The link between the data analysis, literature (section 2) and theoretical foundation (section 3) is to ensure that the study's findings are grounded in established knowledge (Snyder, 2019) of API development and integration. The review was conducted by searching various academic databases and journals, which helped identify critical studies for the research. The nature of the research required that we searched not only IS journals but also other related disciplines like computer science. Notable journals that were searched include the Association for Information Systems (AIS) Senior Scholars' List of Premier Journals. We also included relevant papers from additional IS and some selections from computer science-related journals. This was essential in appraising the quality of the selected articles (Okoli, 2015; Morton *et al.*, 2023). We used a combination of keywords to aid the search process and ensure that the papers selected were relevant to the topic, for instance, keywords such as "API", "API Development" and "API Integration". The Boolean AND was also used to connect the search items and expand the search criteria. For instance, "API" AND "Innovations", "API," AND "Digital Platforms" were used. Only papers within IS and its related disciplines were included in the inclusion criteria. APIs within other disciplines, such as medicine (Active Pharmaceutical Industry), were excluded. The final set of papers informed the literature review (section 2). The review outcome provided a better comprehension of the API phenomenon and helped us better understand the broader social issues related to the phenomenon (Walsham, 1995), such as institutional concepts. The need for further probe into the institutional concepts further led to the use of the institutional theory to unearth the institutional issues that occur during API development and integration.

5. Findings

The analysis and findings suggest certain practices and conditions that inform the basis of the discussion section for this study.

5.1 Internal organizational culture and work practices

The need to embrace a strong working culture is critical for iMuse as it seeks to thrive and compete with established firms. For instance, it is a work practice for every employee to



Source(s): Authors own creation

Figure 1.
Data structure

possess a diary and scout for clients. iMuse comprises a young and dynamic team, and by practice, employees are encouraged to document product and service improvement ideas. Since employees interface with friends outside the organization, they can develop innovative ideas that can translate into ideal products. Through interactions, they can also compel their friends to use the platform. The head of innovations observed that:

> As you can see, the team here is very young, and we encourage everyone to have a diary (notebook) into which they can write their ideas. This team has crazy ideas, which we have succeeded in implementing most. By what we do here, once you engage someone and an idea comes up, including codes of certain application while learning and exploring, you are encouraged to write it in the diary.

Besides promoting the documentation of ideas, the diaries also ensure that they approach their daily work in an organized and structured manner. Per the practice, every employee is supposed to jot down the things they need to do, including those related to API development and integration. This approach may not be black or white but could better be categorized as gray. This is because there are moments when certain technical concepts, like codes, are documented beside ideas. Such a practice helps capture, evaluate and implement ideas and concepts to improve the API development and integration process and outcomes.

This notwithstanding, the ideas translate into products once they are evaluated and later translated into innovative products. An integral aspect is employing people with the necessary API development and integration skills. Unlike most organizations that demand so many years of experience before employing, iMuse often employs raw talents and trains them on the job to solve complex organizational problems. These occurrences have grown and have become a critical organizational culture. According to the CEO, a firm he worked with allowed him to grow when he needed experience. Hence, he made it a part of the organization's culture not to emphasize many years of experience from potential employees before employing them. He provided further information in the following quote:

> Most organizations today require several years of experience before employing young people, and I don't think that is right. When people come for employment interviews, we look out for competence, dedication, and love for what one does, and as you get in, we train you to do more. I believe this country's youth has many potentials that can be harnessed through chance and patience.

Other exciting concepts generated from the interview data and subsequently categorized into second-order codes include personalizing the organization's vision and enhancing the organization's image. The vision of iMuse is one that the CEO believes every employee must make their vision and let it consume them. He explains in the following quote why he encourages employees to do so:

> Once you work here, you need to know that you earn a living here, and as such, you must believe in what we are doing. The firm's vision has to be a burning desire for you, so it does not only become my vision but our vision.

5.2 Imported culture

At the time of data collection, Ghana was blocked from using payment methods like PayPal, thus hindering several organizations from integrating the payment gateway on their platforms. With mobile money being the predominant payment in Ghana, the CEO needed to expand the platform's reach so that people outside Ghana with PayPal and other payment methods could purchase songs. Having furthered his education in Australia, the CEO and platform owner opened an Australian bank account, giving him access to PayPal before returning to Ghana to start the online music sales business. The advantage of an Australian account is that it provides the CEO with a buffer regarding electronic payment options. Somehow, this propelled him to integrate the PayPal payment method onto the digital platform, expanding its boundaries. The CEO and platform owner highlighted that:

> We have been lucky to have other payment platforms, such as Stripe and PayPal, which are not in Ghana. If I were any other firm, we would not have these payment options on our platforms. However, we have these payment options because of my advantage in Australian bank accounts.

The experiences of living outside Ghana also allowed the CEO to study how similar platforms operated. With this in mind, the CEO averred how APIs have helped other established firms to remain relevant over the years. For instance, he noted how established platform service providers, such as Spotify, Netflix, etc., are known for leveraging APIs to automate their

processes and making them one of the most-streamed platforms. Hence, importing those international best practices to position iMuse globally was essential. He highlights that:

> In our space, there are countless successful companies, and I don't see anything wrong with learning from the success stories and implementing those that worked for them. Every digital platform today makes enormous use of APIs, and that is the way to go.

5.3 Electronic payment options

Traditional payment options such as cash still dominate payment for various transactions in most developing economies like Ghana. Access to e-payment options is still a problem despite the progress made. The emergence of digital platforms requires the integration of e-payment options such as credit cards and mobile money. With most Ghanaians remaining unbanked, mobile money has become the ideal alternative to the traditional cash culture. The business development manager added that:

> Considering the platform doesn't accept cash, we are leveraging e-payment options, especially mobile money. More Ghanaians are using mobile money, so we thought that was a good way to get more people on board and increase sales on our platform.

A relation to increased mobile money use in Ghana indicates a corresponding increase in mobile payment ease in online payments. With Ghana becoming Africa's fastest-growing market in the money space, these methods have become normalized. With this in mind, many businesses strictly accept online payment for goods and services, and the ease of using such payment means has made the de facto payment for iMuse. He noted this in the following:

> The ease of carrying your money on your mobile phone is becoming a norm in Ghana as many of us who operate online platforms will require payment through mobile money, PayPal, or visa cards, among others.

5.4 Legal framework

Businesses within a country's jurisdiction must comply with the legal frameworks underpinning business operations. The laws and regulations within the Ghanaian context ensure businesses are trustworthy and act responsibly. These established frameworks also safeguard customers, who are more likely to do business with these organizations. With the government of Ghana's digitalization agenda affecting almost every sector, most government services which hitherto were face-to-face are being migrated online. For instance, driver licensing and passport acquisition are currently online. Another key digitalization outcome is payment interoperability which enables the transfer of funds between different mobile service providers. These initiatives reduce the inefficiencies and corruption that fraught the previous processes. While these policies are geared towards government sectors, private institutions such as iMuse benefit as they facilitate faster and easier transactions with customers irrespective of the mobile network. A manager in charge of innovations averred that:

> The digitalization policy of the government is helping us with API initiatives. Once people are online, their app will likely talk to another app, and you know APIs enable all these.

Also, by law, companies operating within the country must pay taxes. The tax regime of a country affects business operations. The excessive tax regime in Ghana seems to derail most of the innovations set out by iMuse. As a young firm, the demands related to paying taxes to state institutions seem to ruin the entrepreneur's plan. The manager of innovation services laments that:

> We are a small firm, but the tax burden is enormous. We thought we would have some tax exemptions with the government digitalization, but that is not the case. We are burdened with taxes, and it affects innovation here.

5.5 Operational framework

Besides the legal frameworks, operational frameworks guide the way organizations operate. The operational framework guides the organization's policies, aspirations and working practices. The organization's values, culture and identity are essential components within the operational framework. Because APIs integrate data and applications, developers need to understand the parameters of operations and not treat the integration as an afterthought. Operating within the organizational framework ensures that quality products and services are developed. Other essential operational matters include API documentation. The API documentation generally contains the parameters and methods required to call APIs from an integrating firm. Developers are always encouraged to study the documentation before commencing API technical implementation.

> We don't care how beautiful an API is; ultimately, it must be usable. Over the years, we have seen some poor API documentation from third parties that affects the pace of work. Every good API should be error-free, and the documentation must be easy to understand.

5.6 Employee mindset

Like every human institution, employee mindset affects working conditions. For instance, some employees are skeptical and lazy towards embracing most innovations, leading to slow adoption or lack of innovation relating to API initiatives. The aftermath of this relates to being disadvantaged competitively. In the following quotation, one of the study participants laments how some employees sometimes become lazy towards their assignments which has mostly affected the overall outcome of their API initiatives.

> Some developers are lazy and don't do what you ask. Others will take so long doing something that could take a few minutes. We know the work is tedious sometimes, but we expect everyone to work hard for the organization's wellbeing.

It is essential to highlight that when employees become lazy, they become laid back as they are likely to procrastinate, forget and leave work at odd hours, affecting organizational innovations. With forgetfulness, for instance, certain employees forget to change their passwords as they work on API innovations. Others also divulge innovations the firm embarks on to friends without intending malice. To curb such negative attitudes and increasing productivity became an essential subject for the CEO and heads of departments. Frequent meetings with such employees were held and advice was given. In some instances, the employees were encouraged to focus on the work, largely minimizing the impact of such unacceptable working attitudes. The CEO and platform owner highlighted that:

> Despite being energetic, young people can sometimes give you problems. Some feel they have 78 hours in a day and forget we have timelines. In most cases, you have to call them to order else their attitude will affect all of us.

5.7 Employee and third-party ego

Some employees at iMuse placed their interests above the organizations. For instance, we uncovered that some employees only get involved in integrations that they will benefit from. Such situations made those employees feel entitled, affecting some organizational integration projects. Employees cannot work together on some API projects due to their interests, leading

to stalling innovations. The lack of collaboration needed to complete such innovations is missing, thereby hindering them from reaching the organization's full potential. The ego of employees also results in slow and missed innovative opportunities as the employees fail to collaborate on organizational projects. The head of innovations intimated that:

> We have had a situation where some of the guys feel they are more important than others. We have realized its youthful exuberance, and such people needed to be talked to. But when it keeps repeating, we have to terminate the employment of such an employee.

Besides employee ego, we found that some third-party developers also demonstrated the same attitude during integrations. We discovered how some third-party developers insisted on iMuse meeting certain parameters before integrating with them. For instance, the developers of a third-party firm insisted on Internet Protocol (IP) endpoints when there were other options they could explore. One of the content developers emphasized:

> I remember when we wanted to connect with an Internet Service Provider! Well, that did not happen because the developer there insisted on an IP endpoint when they knew we did not have a dedicated server to accommodate IP endpoints at the time. They had options to help us but refused, so we couldn't continue.

5.8 Intrinsic motivation

Another key finding emerging from the data is motivation, which was identified as integral to employees undertaking their work. The CEO understands the importance of motivation for corporate success. As a firm that relies heavily on APIs, there is always the need to integrate data or applications. As a result, employees constantly contact partnering firms to ensure timely delivery integration and product delivery. Words of encouragement, recognition and financial incentives were realized as notable motivations. Recognizing the good work of hardworking employees also served as a significant motivator for employees because they felt the organization valued their contributions. For instance, when people are encouraged to work hard, they are driven to implement innovations that benefit the organization. The CEO noted that:

> I have always worked with people, and they need to be motivated. It is not always about the money, but your kind words can greatly encourage them.

A content developer also highlighted that:

> Our leader (CEO) understands us. You won't be able to tell who the CEO is when you are new here because we are always talking and chatting like family. We get frequent financial tips, and that is all I need.

Financial incentives such as bonuses were vital elements that positively affected API integration initiatives. Such financial rewards motivate employees to develop innovative products for their customers. Financial incentives and rewards ensure employees don't become laid back and take responsibility for their work.

5.9 Extrinsic motivation

Besides the intrinsic motivations, specific extrinsic motivations played critical roles during API development and integration. For instance, employees responsible for innovative initiatives often get encouragement from their friends and family as they recommend iMuse products (e.g. the music platform) to friends and family. For most employees, such encouragements increase their morale and compel them to be more innovative and productive. This is because they feel their work is being noticed outside the organization. One of the content developers recounts that:

> It feels so good when you meet friends and family who use our products, and they give you positive feedback and encourage you to do more. That is a huge morale booster for some of us.

Another source of extrinsic motivation comes from tips that employees receive from some of their clients. Clients and customers impressed with the employees' work tend to give them gifts and money. As part of the organizational policy, employees receiving these incentives, primarily financial or gift items, are supposed to disclose them. However, most employees perceive them as valuable motivations that compel them to work for the greater good of the organization and their clients.

6. Discussion

This study focused on API integration in a digital music platform. Through qualitative data collection, it aims to determine what institutional forces affect (constrain or enable) API integration among digital music platform organizations. The findings unravel outcomes that we subject to further analysis and discussion. Based on our research question and the guiding theory, we discuss the institutional enablers and constraints occurring during API integration.

6.1 Enabling institutional forces

First, the regulative institution in the government's digitalization policy enabled API integration at iMuse. Ghana's commitment to improving the economy through digital technologies has spurred innovation among private organizations. Creating a robust digital infrastructure has been core to achieving a digital economy. Government initiatives like the paperless port, digital addressing system (Acquaye, 2019) and mobile money interoperability enable innovations in the private sector, especially on payment across telecommunication platforms. It helps them improve their payment operations and helps connect different systems as people can send and receive money across various mobile networks and support payment on the iMuse platform. The exploitation and use of these initiatives require establishing new policies and regulatory frameworks that help regulate the practice. Such institutional initiatives are oriented towards regulatory and law-making authorities as it aims to obtain legal backing to promote the initiatives (Rao, 2002; Chaney *et al.*, 2016). Before the digitalization policy initiative (i.e. mobile money interoperability), customers could only send or receive money through the same registered network. However, the mobile money interoperability policy has significantly impacted transactions between customers, the platform and the mobile money operators. Similar outcomes have been realized in other jurisdictions, such as some European Union (EU) countries where policies were introduced to connect their systems to ensure efficiency and transparency easily (Williams, 2018). In all, Ghana's digitalization policy is helping create a conducive environment that enables private and public sector organizations to develop and integrate APIs. This digitalization policy has provided an enabling environment that supports seamless financial transactions through API innovations.

Following the digitalization policy, the normative e-payment culture in Ghana also facilitated API integration at iMuse. The normative pillar depicts values, norms and roles (Scott, 2014; Chaney *et al.*, 2016) that we found supporting the API integration initiatives. By completing the mobile money interoperability platform, there has been an increase in mobile money transactions in the different operating platforms. As a result, more people are compelled to use e-payment platforms since they afford efficiency. The normative payment culture, predominantly cash in most developing economies like Ghana (Okoli *et al.*, 2010), inhibits innovations such as those that support online payment. With more people now using mobile devices, the need to use mobile phones in facilitating the payment process influenced

the development and integration of APIs. For instance, the increasing number of mobile money users (currently about 60% of Ghana's population) (Sasu, 2023) is creating a culture that enables iMuse platform users to use more mobile money payment options to purchase songs and subscribe to the platform's services. Besides mobile money, the predominant method, other methods like Visa card, Master Card and PayPal enable API initiatives in the digital music platform since it provides similar befits. These existing (new) payment options primarily impact the normative pillar as they influence peoples values, norms and expectations of payment methods in iMuse platform ecosystem (Gümüsay *et al.*, 2022). This outcome is consistent with previous reports that suggest the interplay between e-payment options like mobile money and API integration (Pasti and Awanis, 2019).

Another exciting normative institution we found to have enabled the development and integration of APIs is the growth of the Internet and mobile technology in Ghana. Currently, in Ghana, mobile phone users have surpassed the total population. With a current human population of over 30 million, Ghana has over 40 million mobile phone subscribers (Tamakloe, 2018; O'Dea, 2021). The proliferation of Internet-enabled mobile devices has encouraged iMuse to integrate more APIs to deliver music services. The youth are the Internet's major users and fall in the most active workforce bracket. While most of them spend more time online, providing services that enable them to purchase music online from the comfort of their homes is a welcoming idea. The normative pillar of the new institutional theory broadly shapes the norms and values related to how customers consume the products and services provided by the iMuse platform (Agyei-Ababio *et al.*, 2023). The Internet and mobile technologies have broadly transformed the music industry regarding access and convenience. As such, users of digital music platforms such as iMuse demand seamless access to music products and services through their mobile devices.

The normative institution in the organizational culture of promoting competence and working towards the vision also spurred API innovations. Organizational culture consists of the shared beliefs present that guides work processes iMuse. These organizational practices ensure legitimacy (DiMaggio and Powell, 1983; Zucker, 1987). At iMuse, the advantage of an Australian bank account resulted in using payment platforms that were not accepted in Ghana at the time. The imported culture of an Australian bank account has become a norm since it opens more avenues for online payment, especially for customers outside Ghana. Others, such as possession of diaries and notebooks and employee technical know-how, were found to facilitate. The culture of possessing diaries, a shared belief at iMuse, suggests shifting norms that encourage and value employee creativity. It indicates a culture and fosters the development of new ideas and the initiative to document their ideas. Embracing organizational culture and work practices ensures the successful implementation and use of organizational information systems (Agyei-Ababio *et al.*, 2023). As an emerging firm, iMuse is noted for encouraging competence as it helps set the pace for the abilities and skills expected in the organization. Such normative expectancy of competence required of every employee shapes employee behavior and how they approach API development and integration and encourages a culture of learning and development. Previous studies prove that employee competencies are essential to organizational innovation success (Awa *et al.*, 2017; Low *et al.*, 2011).

The enabling institutional forces establish that employees' relationships and lived experiences are pivotal in developing and integrating APIs. For instance, clients' interactions with workers sometimes influence their decision to do business with iMuse. It presupposes that the mobilization of social capital in individual acquaintances with clients determines which kind of service clients demand. It became evident that most of the organization's contracts resulted from relationships between employees and clients, which could emanate from the cultural conditions in some developing economies. Therefore, the organization has made it part of its policy to reward employees through whom contracts are won. Such

bonuses, awards and recognitions have become institutionalized since they guide employees' social behavior and have evolved over the years (Vial and Rivard, 2016). Past research has also emphasized the need for a good relationship between software developers and their clients (Saiedian and Dale, 2000).

Lastly, this study found another institution, *"motivational institution,"* emerging from the recognized three pillars of the new institutional theory. We suggest that various institutional provisions like regulations and cultural norms can shape and strengthen people's motivations in organizations. Managers of organizations can put in place institutional arrangements that seek to motivate workers and encourage them to be more productive. Such arrangements are mainly introduced once, but as they evolve, they become widely accepted and subsequently institutionalized because of people's influences, interests and actions (Kostova, 1999; Vial and Rivard, 2016). The process leading to the emergence of motivational institutions can be an effective strategy to motivate employees and the organization to reach their goals. The realization of motivation as an emerging institution from the institutional theory is further heightened by how motivations differ across different contexts (Peng *et al.*, 2023), as some institutions, such as culture and resources, can shape motivations among individuals and groups.

We conceptualized motivational institutions as they formed a major enabling force in API development and integration. For instance, encouragement, incentives and bonuses highly enabled employees' attitudes toward API development and integration. As highlighted in the findings, the various motivations which occurred once have been institutionalized over time through consistent interactions and engagements with the actors. Intrinsic and extrinsic motivations have emerged as critical forces supporting employees' iMuse actions. Intrinsic motivations constitute those individual and internal interests that motivate people to act, enabling them to become fulfilled (Venketsamy and Lew, 2022). Extrinsic motivations focus on external rewards and incentives workers receive that propel them to engage in or act in a certain way. These arrangements, which are now institutionalized, encourage employees to improve their work, work harder and become more productive.

In summary, it is worth noting that government digitalization policy, increased e-payment options and motivations were critical enablers of API integration among Ghanaian firms. Nonetheless, other constraining forces were hindrances to API development and integration. These constraining forces are discussed in the next section.

6.2 Constraining institutional forces

Some interesting insights have emerged concerning regulative and cognitive norms that encumbered API development and integration. For instance, excessive tax regimes imposed by governments hindered API integration initiatives at iMuse. The analysis shows how the national tax obligation regulation constrain the organization's API initiatives. Taxes are primarily mandatory financial charges imposed on individuals and organizations by a government to finance government expenditures. Emerging digital organizations such as iMuse believe they are overburdened with taxes when they should enjoy certain tax exemptions to encourage industry growth. Being limited by resources, excessive taxes have become additional financial burdens to iMuse, resulting in limited investments in API innovations that can open them up to other organizations in their ecosystem. Studies that used the institutional theory revealed how taxes affect the regulative pillar of the theory (Pournarakis and Varsakelis, 2004; Trevino *et al.*, 2008). Other general studies on digital innovations have also shown how taxes like those on income affects innovation negatively (Ezrati, 2020). The recent passage of the electronic transfer levy (e-levy) in Ghana jeopardizes Ghana's mobile money and digital platform industry (Tagoe, 2022). On the other hand, tax exemption or tax reduction regimes are also seen to spur innovation.

It is also worth noting that some cultural-cognitive practices, such as employee forgetfulness and failure to adhere to organizational policies, such as security, hinder APIs' development and integration. Such employee cognitive behavior is usually taken for granted but adversely affects the development and integration of APIs. For instance, changing passwords is important based on policy and shared understanding at iMuse. Securing APIs during development is crucial, and developers must periodically change their passwords to ensure APIs' integrity and conform to best practices. However, there are situations where some personnel fail to change (due to forgetfulness) their passwords, stalling several API initiatives at iMuse. Such occurrences are mostly observed due to prevailing security culture and sometimes a lack of awareness. If not checked, these practices influence employees' perceptions, shaping their identity (Lang, 2018). While it is known that employees are bad at choosing strong and complex passwords, organizations have begun to implement policies that will help protect their work. For instance, security policies on the length and characters of passwords are being implemented in many organizations (Weber, 2020).

Again, the institutional structure and procedures of some organizations in Ghana do not allow integration with other firms. Some institutions do not consent to data residing outside their organization; hence they don't encourage integrations. In Ghana, institutions such as Social Security and National Insurance Trust (SSNIT), the Electoral Commission and others do not agree on having their data outside the organization. Such institutional bottlenecks are considered to have national security and ethical implications. This makes it difficult to develop or integrate with such institutions. Though iMuse does not have challenges integrating with institutions, some of the interfacing institutions have laws and policies and excessive bureaucratic structures (Pournarakis and Varsakelis, 2004; Trevino *et al.*, 2008) that prevent other organizations, especially non-governmental organizations, from interfacing with them. For example, SSNIT stores data such as the pension data of clients. Therefore, it is imperative to safeguard the integrity of such data; as such, they have guidelines that aid them. Though some of these guidelines and regulations do not state verbatim that data resides only internally, they are treated as given because of the underlying political, ethical and social implications (Ofoeda *et al.*, 2018). According to Clark (2015), organizations limit access to their applications only to trusted applications and users to address data misuse issues. Like in the case of iMuse, reports suggest that firms sometimes face resistance when opening up and sharing assets with other external applications.

Furthermore, the developers' own cultural-cognitive institutions in their thinking and relation with others have constrained API initiatives. As noted in the findings, some employees unconsciously disclosed sensitive work-related issues to friends and family even though they never intended malice. Employees have friends in competing firms; hence, sensitive information is unintentionally disclosed. Others also become lazy when they need to embrace innovations. These supposedly taken-for-granted ideas have unintended consequences for the firm and its clients. Shaikh and Vaast (2016) alluded to this by positing that taken-for-granted customs have affected open-source communities' work. Mulesoft's Connectivity Benchmark Report (2016) also states that these institutional apathies could hinder an entire API strategy. It is worth noting that other contexts, such as the Western world, will most likely relieve such employees of their work. However, the findings from the Ghanaian context show that Ghana's unique social and cultural values make managers more tolerant and not extreme in their decisions. In most Ghanaian organizations, employees like their employers value relations more than schedules (Mensah-Bediako, 2012). Like the CEO and departmental heads' advice, ministers of state have resorted to advising Ghanaian workers to change their negative work attitudes. Some of the negative work attitudes include procrastination, laziness and lateness, which negatively impacted the output of several state organizations (Yuora, 2020).

6.3 Theoretical contributions

The findings of this study offer some theoretical implications. For instance, like in previous studies, institutional forces have negative and positive consequences even though they produce tensions, making reconciling interests complex (Hansen and Baroody, 2020; Senyo *et al.*, 2022b). Our study contributes to the literature by explaining the institutional forces occurring during API development and integration at the organizational level, which previous studies have not addressed. Previously, these issues were complex to grasp theoretically due to the technical dimensions in which APIs were perceived without considering the social and cultural conditions that affect such important innovations.

Second, this study contributes to the larger conversation on digital ecosystems and the digital economy, which are critical for economic growth. According to the World Bank, the digital economy initiative for Africa (DE4A), the Africa transformation strategy seeks to ensure that individuals, businesses and governments in Africa are digitally enabled by 2030 (Neto and Rogy, 2021). Often, research on digital transformation is geared toward platforms and ecosystems. While crucial in this transformation journey, API is unintentionally neglected within the larger context of the academic innovation discussion because it tends to be perceived as more technical. This study provides a stepping stone to reignite the conversation and attract more interest in API, especially the social issues that shape API innovations.

Third, with APIs being boundary resources for digital platforms, this research also contributes to digital platforms (Ghazawneh and Henfridsson, 2013; Wulf and Blohm, 2017). Platform providers are considering APIs as a strategic resource that determines the prosperity of their platforms. The findings of this research provide platform providers with pertinent concepts that were not discussed in the mainstream literature. As established in this research, these issues will inform platform developers of users of the platforms required, which could influence the likelihood of developing new forms of applications for the platforms (Xue *et al.*, 2017).

6.4 Practical implications

Our study also offers some practical implications. First, it provides essential insights into how small firms, especially those in emerging economies, can leverage APIs to address their organizational and integration needs, especially those related to the United Nations Sustainable Development Goals. The study's findings can be related to goals 8, 9, 10 and 13 of the UNSDGs. For instance, regarding goal 8, the development of the API-enabled platform through the creation of decent and new job opportunities that translate to economic growth. Goal 9 ensures innovations and infrastructure development, leading to increased productivity. Goal 10 helps in reducing the inequalities in people accessing music since online music is accessible to all manner of persons. Goal 13 ensures that developing countries reduce the environmental impact of producing and distributing music on physical mediums such as CDs through API integration.

Second, the study shapes our understanding and further reaffirms the transformational roles of API innovations for the betterment of individuals, businesses and nations. The study highlights an emergent music platform provider that harnessed the importance of APIs with other related technologies to overcome the traditional method of selling music on CDs. We have successfully shown in the study that boundary resources such as APIs can connect systems and provide a rich user experience to eliminate duplication, mainly arising from siloed systems.

Third, our study offers valuable insights to firms that seek to leverage APIs. Firms must consider social (institutional and cultural influences) and not only technology-related issues. We also argue that policymakers need to focus on regulations supporting the expansion of

the API economy, especially in emerging economies. Enabling regulations, laws and policies have become necessary in the wake of Ghana's recent e-levy act, which puts a 1.5% charge on all electronic transactions. Many have kicked against the policy, indicating it stifles innovation in the digital space (Amaning, 2022). Our findings are also valuable to firms that seek to transfer technology to their local contexts by understanding the institutional forces that enable or hinder successful API integrations.

6.5 Limitations and future research directions

Like any other study, this has some limitations, and we advise readers to be aware of such limitations and interpret our research amidst the framework of these limitations. First, because we relied on a single-case study in Ghana, our findings cannot be generalized on a population level (Gkinko and Elbanna, 2022). However, it can be generalized on theory (Lee and Baskerville, 2012), as it will help advance understanding in both theory and practice. Theoretical and analytical generalizability, which we deem better suited than statistical generalizability, can help open up opportunities for future research on APIs. Also, given that countries have different idiosyncrasies, experiences and technological advancements, the findings may not be generalizable in other contexts (Senyo *et al.*, 2022b). Future research can undertake comparative studies in other Global South economies, which could offer varying and valuable results and strengthen the study's findings. Furthermore, because our study adopted a qualitative approach to unearthing the institutional enablers and constraints in a digital music platform, future research can focus on a mixed method to offer an alternative (statistically realistic) understanding of the API phenomenon without sacrificing the value and complexity of the richness of qualitative approaches (Gkinko and Elbanna, 2022).

While our study focused on interviewing participants within a digital music platform organization, another important direction is to focus on big technology firms and government agencies in the digital ecosystem. These players, potentially on the upside, will offer valuable insights into APIs and the digital ecosystem. With countries digitalizing their services, their role and formal relationships with huge technological organizations such as mobile network operators and Fintechs cannot be underestimated. Finally, API strategies have become integral for firms that seek increased productivity. We suggest future research explores API strategies within developing economy firms, especially small enterprises. Notably, future research can explore whether or not firms have API strategies.

7. Conclusions

This study set out to understand the institutional forces that shape API development and integration in a music platform organization in a developing economy. The study's findings have shown that normative institutions, like the increasing use of e-payment options, enabled API integration. Cultural-cognitive institutions such as excessive tax obligations and employee forgetfulness constrain the API integration process. Other outcomes of our study suggest that regulative institutions such as excessive tax regimes constrained the API integration process, while the government digitalization agenda was seen as an enabler. Lastly, our study found a new form of an institution known as *motivational institution* as an enabler for API development and integration.

Regarding originality, our study deviates from the purely technical literature on API integration, thus applying the new institutional theory to examine the forces that enable or constrain API integration using evidence from a Ghanaian digital music platform. Previous studies have focused on the following: (a) digital platforms and digital ecosystems and how they transform businesses; (b) developing APIs using various programming languages. However, this study takes a socio-technical approach by examining the institutional forces

that shape API development and integration. Specifically, our study investigated how the pillars of the new institutional theory, regulative, normative and cultural cognitive, influence the API development and integration process. The choice of the new institutional theory provided a more holistic and comprehensive understanding of a complex phenomenon such as API development and integration, a concept that has been observed mainly as a technical tool.

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