

Deciphering the Interdependencies of Business Process Management and Digital Transformation

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Abstract

This piece provides a pragmatic approach to the concepts of business process management and digital transformation. Additionally, it explores the inherent interdependencies present between the two schools of practice. Subsequently, it highlights the current trends relating to digital transformation and the evolution of business process management globally. Time is devoted to expounding on academia's theoretical concepts and perspectives of business performance management methodologies and techniques to improve and re-engineer processes to meet strategic goals. Identically, the report will address the concepts of digital transformation and the dynamic trends leading to the need for clarity about relativity to business processes. Chapter three of the report will further develop the concepts using practical examples, studies, and academic literature to provide empirical and qualitative evidence of the impact of emerging technologies on business strategy and the need to determine underlying interconnectivity. Central to business process management and digital transformation theories are the ambidextrous requirements of business process management to evolve in parallel to emerging technologies. The report closes with identifying an inherent cause-and-effect relationship between the two ideologies to include perceptual considerations of specialists in the field. Additionally, it will recommend unearthing the maximum benefits of co-creating business processes and information technology to drive and adapt to digital transformation.

Keywords: ambidextrous, business process management, digital innovation, digitalization transformation, emerging technologies

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Chapter 1

Deciphering the Interdependencies of Business Process Management and Digital Transformation

The state of business and transactional activities continuously evolves due to the demand for more information-centric decisions and applications processes. Driven by emerging technologies of the fourth industrial revolution reshaping the way people approach business. Moreover, the expansion of artificial intelligence, machine learning, blockchains, and the Internet of Things, renders organizations insensible to maximizing the inherent benefits within the business environment. Antiphonally, business models, structures, and processes must practice ambidexterity by adapting and integrating new versions of business process management (BPM). The foundation of ambidexterity lies within the ability to exploit all benefits of existing innovations and the subsequent exploration of the benefits of those said technologies (Ahmad & Van Looy, 2020). The preceding approach leads to exploitive and explorative business process management (BPM) techniques that guarantee equitable evolution in parallel to evolving technologies.

Simultaneously, business transformation is reliant on integrating emerging technologies into business processes. Hence, encouraging survival and growth in participating and potential markets, especially in scenarios where emerging technology becomes applicable in broad scales of usability and competitiveness. However, in response to the demand for innovative processes, agile and flexible disciplines in process management become relevant to balancing business and consumer requirements. Conveniently, business process management (BPM) focuses on analyzing process design and improvement in activities (Ahmad & Van Looy, 2020). A precursor to this focus is that the emergence of innovative technologies broadens the applicability beyond simply lean cost improvements to digital enhancement and transformation of tools and techniques.

This report attempts to decipher the relationship that exists between business process management and digital transformation. To effectively explore such interdependencies, the paper

will address how business process management drives digital transformation. Understand the impact of digitalization on business process management and processes that ensue. Additionally, the report applies academic perspectives against case studies and practical use cases to provide empirical evidence to support the existence of woven relations between the two schools of business ideologies. An antecedent to the hypothesis of establishing a cause/effect relationship between business process management and digital transformation, the report will independently expound the concepts theoretically to draw connectivity associations.

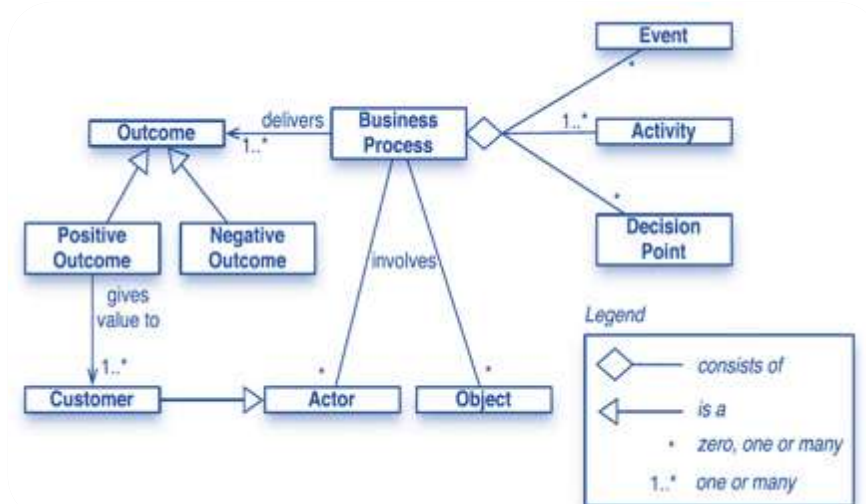
1.1 Process and Process Ingredients

The foundation of business process management goes beyond managing activities in singularity but managing interconnected chains of occurrences, activities, and decisions that undoubtedly add value to its business and customers. These interconnected chains of activities, events, and decisions are known as processes (Dumas et al., 2013). Through simplicity, this section examines the fundamental aspects of current business operation and identifies the ingredients of said process to define the concept of business process management.

Processes exist in all shapes and forms, and for businesses to exist, several basic value-added processes come into existence. For example, the order-to-cash, quote-to-order, procure-to-pay, issue-to-resolution, and application-to approval, to name a few. Consequent to these process steps, the design and execution are critical to meeting customers' expectations (internal/external) and the quality of the product or service provided. Business processes include several events, activities, and decisions. Dumas et al. (2013) eloquently express that an event is atomical and not time-bound, triggering subsequent simple or complex steps (p.3). The more uncomplicated steps or single work units refer to tasks, while the more complex combination is all time-bound activities. Additionally, events and activities include decision points that occur at differing intervals that affect process execution.

Figure 1.

Ingredients of a Business Process



Notes: Adapted from Fundamentals of Process Management (p. 6). M. Dumas et al. 2013. Springer. Copyright 2013 by Springer-Verlag Berlin Heidelberg.

Notwithstanding events and activities, processes involve several actors, physical objects, and immaterial objects (Dumas et al., 2013). Actors refer to people, organizations, or software systems that act on behalf of people or organizations. Physical objects refer to equipment, material, product, and documentation, while immaterial rest with electronic documentation and records. At the point of execution of a process, it leads to an outcome or several outcomes. The said outcome can be negative or positive, value-added, or non-value added. This outcome impacts the actors involved in the process and, by extension, the customer (the actor who consumes output). In retrospect, a business process is a collection of related events, activities, and decision points that involve actors and objects that collectively result in an outcome that adds value to a customer (Dumas et al., 2013)(figure 1). From this conceptualization, BPM is the group of methodologies, techniques, and tools that aid in analyzing, designing, executing, and monitoring business processes (Dumas et al.,

2013). From this perspective, BPM also provides concepts to plan, organize, monitor, and control process execution following a structured view known as the business process management lifecycle.

1.2 Business Process Life Cycle

In every cycle, there exists a chronological set of steps that, if followed carefully, will provide an outcome that meets expectations. The BPM lifecycle is no exception. The process, as described by Dumas et al. (2013), outlines six (6) steps (figure 2).

Step 1: Process Identification

Defining the process to improve is critical as adequate process thinking is necessary for several reasons; the first is to identify the processes that are relevant to a specific problem. Second, delimit the scope of the process and thirdly, identify the relationships between it and other processes. This identification phase leads to a process architecture that illustrates the collection of processes and linkages representing each relationship type. However, owners must define performance measures or process performance metrics that help determine its health through its cycle time to understand if the process adds value effectively. Establishing such measures allows for identifying performance objectives that are critical to this phase.

Step 2: Process Discovery

In this phase, the owners or team uses the process measures to determine the business process in detail. Typically, the outcome of this phase provides one or more as-is process models. This as-is model reflects the teams' comprehension of how the workflows from step to step. However, to effectively represent these steps, process teams employ diagrams to model business processes. Diagrams provide a simplistic and comprehensive view of processes using notations. In this phase, teams use process modeling techniques employing

specific modeling languages to illustrate processes diagrammatically. The report explores these languages in the impending chapters.

Step 3: Process Analysis

After identifying the process and modeling it diagrammatically, it is necessary to analyze it from deviations or inefficiencies that deteriorate the value-added expectations. Such inefficiencies include waiting or idle times, rework duplicated steps, and overall lengthy cycle times. It is by identifying and categorizing these inefficiencies that process analysts determine the root causes of adverse outcomes.

Step 4: Process Re-design (Process Improvement)

After identifying and quantifying the root causes, the next step is to analyze the potential measures to close these gaps. At this interval, there are multiple options for addressing anyone process inefficiency. Note, however, that identifying inefficiencies in the process is more accessible than effecting an actual change. The fundamental causes are the differing the levels of resistance and impact of change, such as cost. Once the issue is understood, the analysts can cascade potential remedies to propose a re-design or to-be process to fix the as-is process.

Step 5: Process Implementation

After determining the new to-be model, it is time to implement the new process. However, the implementation involves two complementing facets: organizational change management and, secondly, process automation. Dumas et al. (2013) explain that organizational change management is a set of activities geared at changing the way participants execute work in a process. In comparison, process automation is the development and deployment of information systems that support the new state of the process (p. 22).

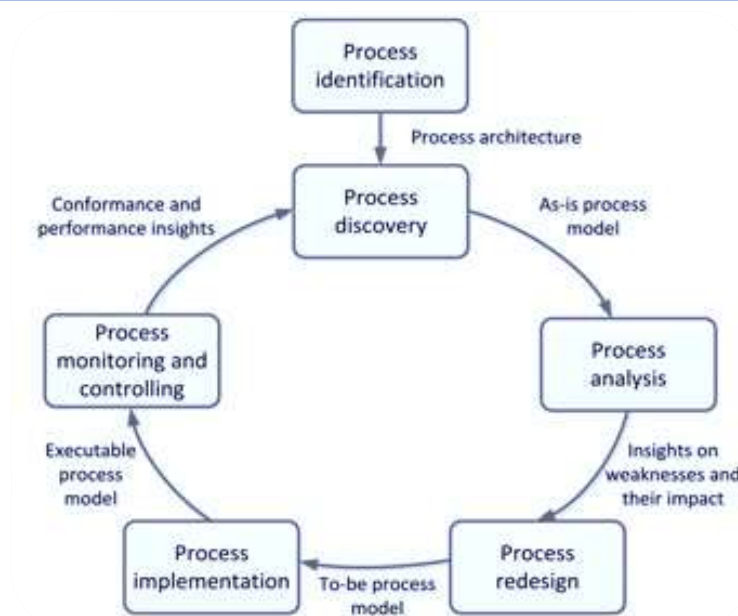
Step 6: Process Monitoring and Controlling

Lastly, once the re-engineered process is running and data is available, the process can go through a state of analysis to determine the level of performance against performance metrics and objectives. In this phase, analysts identify areas causing bottlenecks, deviations, and errors against expectations and continuously propose and implement corrective actions.

Ideally, the BPM life cycle provides coherency concerning process management and the role of information technology in the concept. Information technology (IT) in different spheres is critical to improving business processes and, in most cases, requires input from specialists in the field. On this premise, ensuring the right people (participants) are a part of BPM initiatives within organizations is crucial. These often extend to include managers, administrative/functional team members, business and system analysts, and IT teams. However, are the benefits of BPM only limited to improved business processes through process re-design?

Figure 2.

Business Process Management (BPM) Lifecycle



Notes: Adapted from Fundamentals of Process Management (p. 21). M. Dumas et al. 2013. Springer. Copyright 2013 by Springer-Verlag Berlin Heidelberg.

1.3 Benefits of Business Process Management

In an article by Kerie Kersteller (2018), she examines several critical benefits of BPM. Firstly, she identifies business processes as the blueprint for business activities, breaking down activities into distinct repeatable tasks. To this end, the article reiterates that BPM's goal is to align business processes with the organization's corporate goals through mapping steps and streamlining processes that improve efficiency and consistency.

It is on that foundation that Kersteller (2018) identifies six additional benefits of employing BPM in organizations.

1. It improves business agility by creating agile processes that react quickly to demands and competition.
2. BPM increases efficiency by removing inefficient processes that generate waste that is usually difficult to identify and change.
3. BPM also allows for complete visibility, resulting from consistent performance monitoring along the process cycle.
4. Additionally, BPM creates an environment of compliance and security by enforcing adherence to rules and regulations that guide productivity and quality.
5. Also, BPM makes it easy to transfer business knowledge due to structured and documented process maps. BPM encourages the creation and archiving of process flows and notations for continuous use, hence reducing knowledge loss.
6. BPM provides opportunities for continuous improvement by establishing initiatives set on successfully changing processes. All the information that BPM provides allows an organization to refine current processes and adopt new ones to guarantee continued success.

Nevertheless, how do organizations model processes so that they are coherent and easily understood by all stakeholders? The simple answer is to use the available process modeling techniques and languages across different disciplines and theories of BPM, as explained in the previous sections. However, the next chapter will explore the various process modeling techniques available to BPM practitioners to map and analyze business processes.

Chapter 2

Business Process Modelling Techniques

The previous chapter mentioned uses different process modeling techniques and languages for effectively executing BPM in an organization. This chapter will review twelve (12) such languages/techniques as the basis for clarifying the modeling process in the BPM lifecycle. Moreover, to understand the connections between digital transformation and business process management, there must be a clear understanding of how the holistic BPM lifecycle works and where digital transformation becomes applicable as an interdependent concept. Interestingly, these varying techniques find support in Business Process Management System (BPMS) platforms that digitize these techniques to integrate the collection, organizing, automation, and analysis of process modeling approaches in the business environment.

2.1 Business Process Modelling Notation (BPMN)

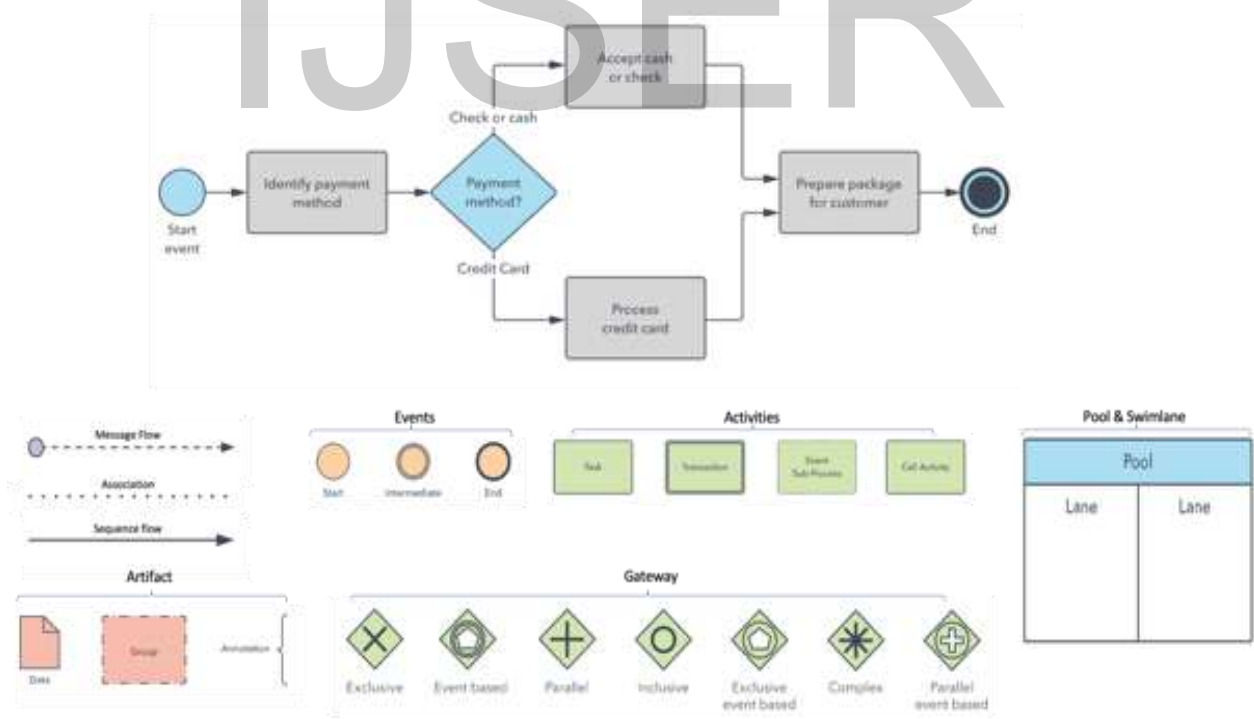
Dumas et al. (2013) introduce Business Process Modelling Notation (BPMN) as the most widely applicable standard for process modeling. Subsequently, still referred to as BPMN, The Object Management Group (OMG) amended the original language with updates changing its name to BPMN2.0 in 2011. Accordingly, the flow chart method illustrates business processes from beginning

to end (Lucid, 2021). It depicts details of sequences in the business activities and how to execute information flows to complete a process.

Although not a complex language, the BPMN consists of several elements depicted by shapes and supporting contextual meanings along the process (figure 3). These include flow objects such as events, activities, and gateways (decision points). Connecting objects inclusive of association, message, and sequence flows. Swimlanes consist of pools or lanes to depict different departments or companies defining accountability points within a process (Lucid, 2021). Lastly, Artifacts provide additional data sets for developers to bring detail to the diagram through data objects, groups, or annotations. In comparison, data objects show the data necessary for the activity. The group illustrates the logical grouping of activities, and the annotation clarifies that section of the diagram.

Figure 3.

Business Process Modeling Notation (BPMN and BPMN2.0)



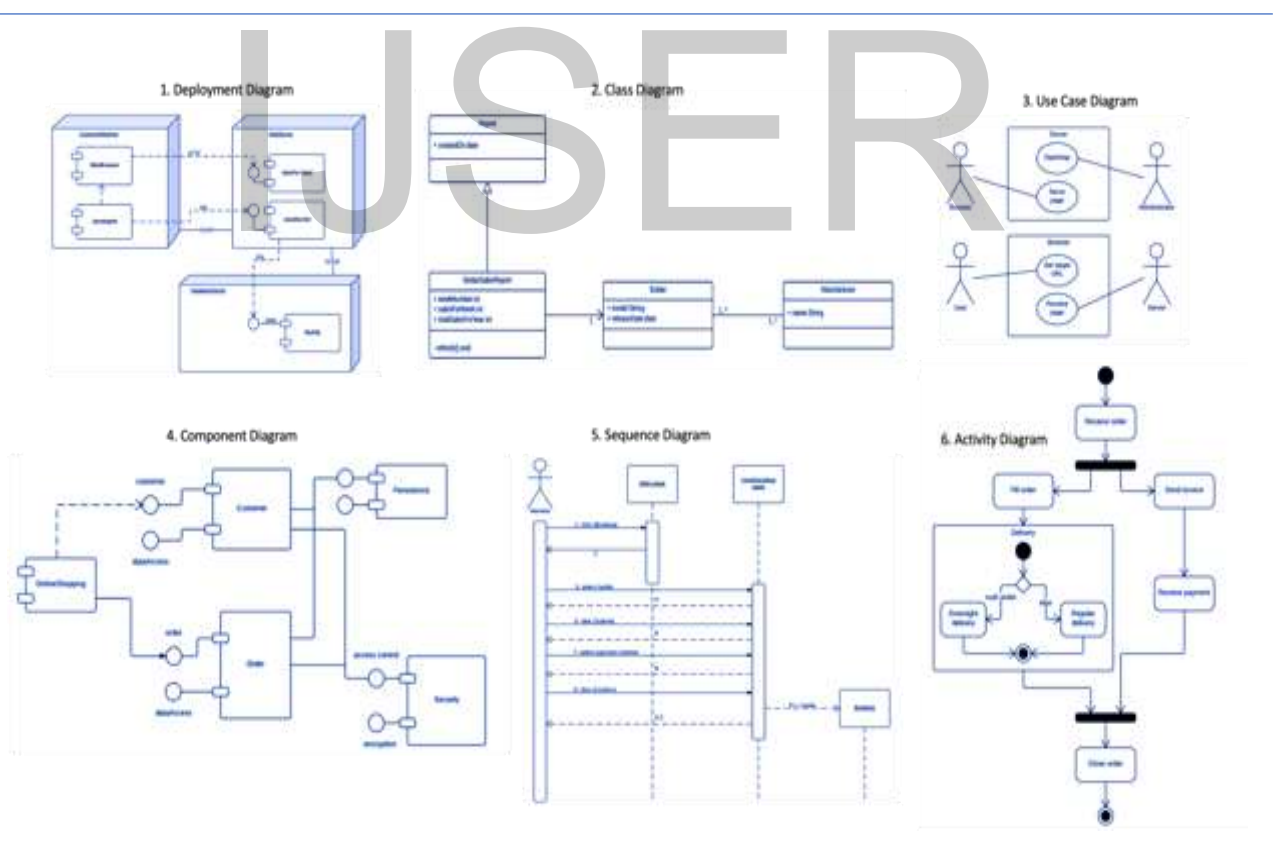
Notes: What is Business Process Modeling Notation. <https://www.lucidchart.com/pages/bpmn>. Copyright 2021 by Lucid Software Inc.

2.2 Unified Modelling Language (UML)

Dumas et al. (2013) also explain that UML diagrams are cross-organizational flowcharts that provide symbols to illustrate data objects, signals, and parallelisms (p.17). UML provides a standard, syntactical, and semantically opulent visual modeling language for systems architecture, design, and implementation (Lucid, 2021). Furthermore, UML is applicable to process flows in the manufacturing environment. Additionally, UML is equivalent to blueprints and consists of a different diagram to describe the processor system's structures, boundaries, behaviors, and the objects within. Figure 4 highlights some of the multiple UML support diagrams applicable to a variety of process modeling requirements.

Figure 4.

Unified Modeling Language



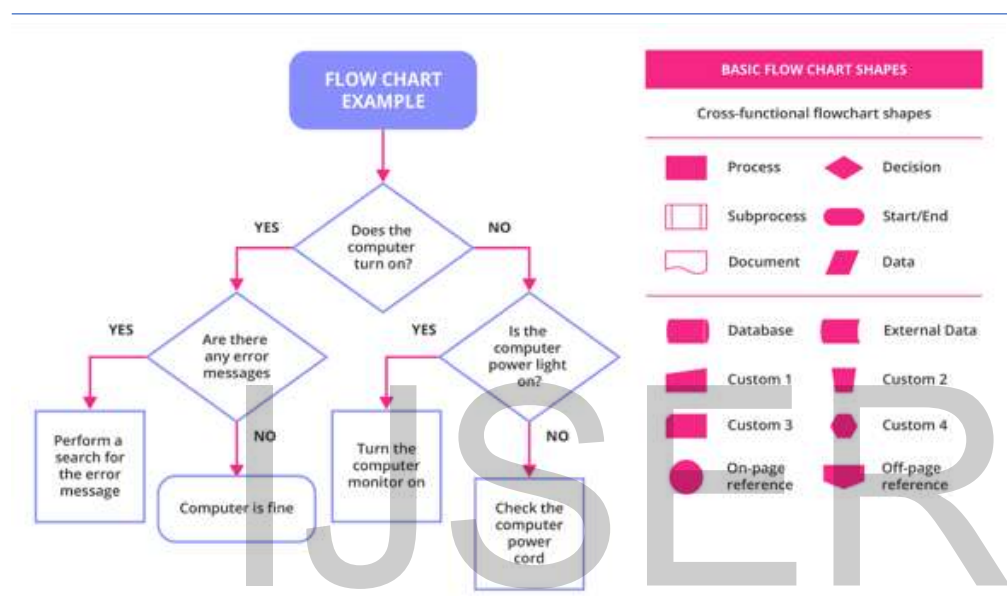
Notes: Adapted from What is Unified Modeling Language. <https://www.lucidchart.com/pages/what-is-UML-unified-modeling-language>. Copyright 2021 by Lucid Software Inc.

2.3 Flow Chart Technique

This technique allows for focus on a project or processing a single reference set. This graphical representation uses basic shapes like BPMN, including arrows, to depict relationships such as decisions process steps and data (figure 5).

Figure 5.

Flow Chart Technique



Notes: Adapted from 10 Business Process Modelling Techniques Explained, with examples.

<https://www.getsmarter.com/blog/career-advice/10-business-process-modelling-techniques/>. Copyright 2021 by

Getsmarter.

2.4 Data Flow Diagrams (DFD's)

Data flow diagrams illustrate data movement as it enters a system from external sources and moves internally throughout the system, and archived. The symbols in DFDs are minutely different but found on the same premise as previous techniques. For example, squares depict external entities as a source of data or endpoint (GetSmarter, 2020). Rounded rectangles as processes that accept data as input and interact to produce valuable outputs. Arrows highlight the directional flow of data via electronic or physical means and open-ended rectangles, which portray data stores inclusive of electronic databases or files and physical stores such as cabinets and paper stacks.

Figure 6.

Data Flow Diagrams



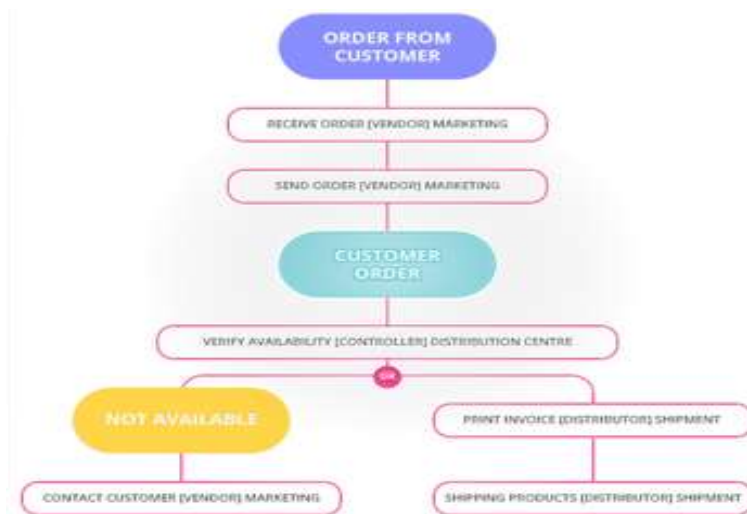
Notes: Adapted from 10 Business Process Modelling Techniques Explained, with examples.

<https://www.getsmarter.com/blog/career-advice/10-business-process-modelling-techniques/>. Copyright 2021 by Getsmarter.

2.5 Role Activity Diagrams (RADs)

Figure 7.

Role Activity Diagrams



Notes: Adapted from 10 Business Process Modelling Techniques Explained, with examples.

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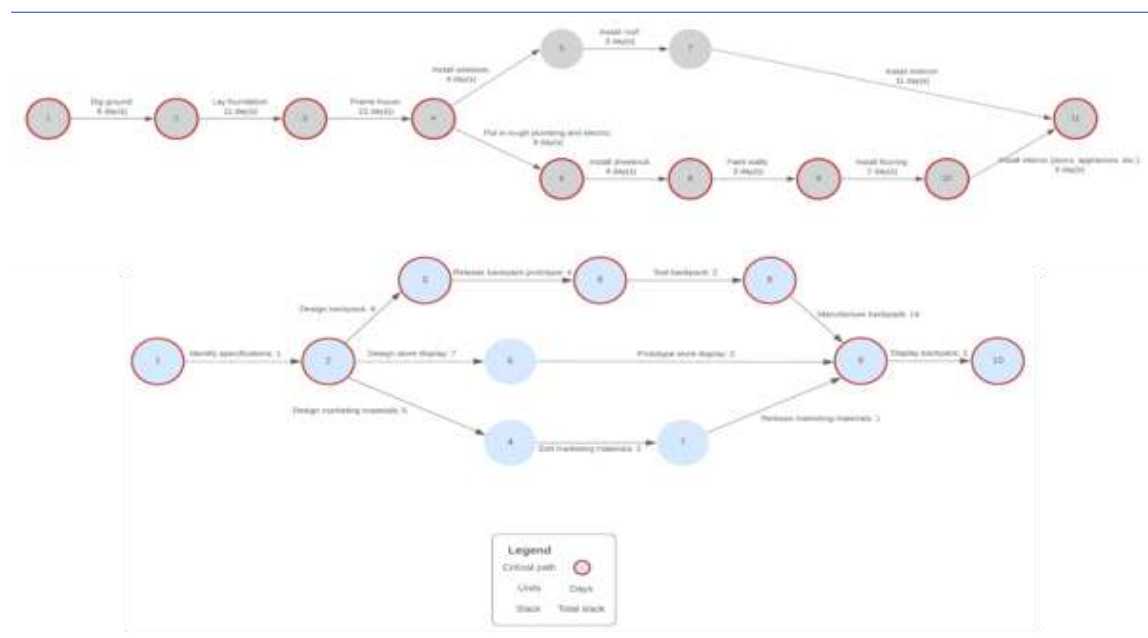
Companies use Role activity diagrams to map intangible roles or concepts of behavior that an organization needs. These often replicate functions with the business environment such as IT systems, customer, and supplier roles. RADs are simple to comprehend and often provide a variety of perspectives on processes that aid in improving communication (GetSmarter, 2020).

2.6 Program Evaluation and Review Technique (PERT) Diagrams

Teams use PERT charts to illustrate projects as network diagrams. This tool gauges the minimum time requirements to complete a project, analyze a task, identify connections, and assess project risks. Therefore, displaying dependencies between each step within the project development (Williams, 2021). Additionally, the PERT chart has two elements; first, the nodes show milestones or events in the project, denoted by circles or numbered boxes. Secondly, arrows represent tasks and show the direction of the flow of tasks (figure 8).

Figure 8.

Program Evaluation and Review Technique (PERT) Diagram



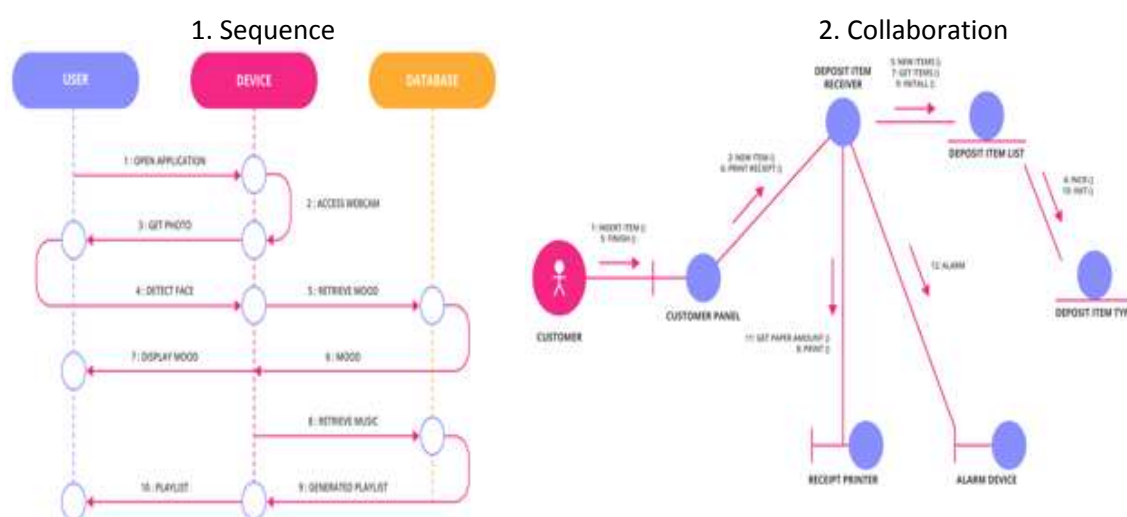
Notes: Adapted from Advantages of PERT charts vs. Gantt charts. <https://www.lucidchart.com/blog/advantages-of-pert-charts-vs-gantt-charts>. Copyright 2021 by Lucid Software Inc.

2.7 Role Interactions Diagrams

Compared to several of the techniques in prior sections, the role interaction diagram graphically illustrates the interaction between various processes within a system. The tool shows this in two ways, firstly the sequence diagram. This diagram highlights the interaction with objects in the sequence of occurrence. After which, it describes the function of each object, the order, and the future modifications of existing and new systems (GetSmarter, 2020). Secondly, collaborative diagrams define and clarify the role of objects that execute a specific flow of events in a visual model and serve as the primary source of information for determining class, interfaces, and responsibilities (GetSmarter, 2020).

Figure 9.

Role Interaction Diagrams



Notes: Adapted from 10 Business Process Modelling Techniques Explained, with examples.

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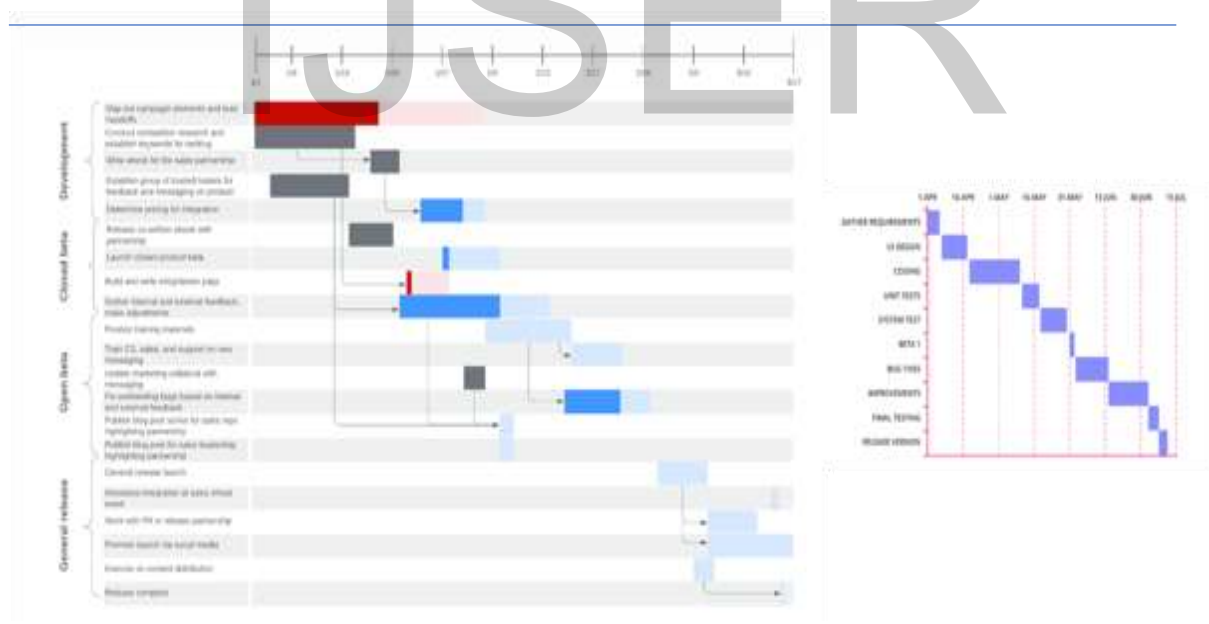
GetSmarter.

2.8 Gantt Charts

Like PERT Diagrams, Gantt charts are applicable to project planning with distinct timelines that are time-sensitive processes that require consistent tracking and monitoring (GetSmarter, 2020). The chart dictates when work must begin when it should end, and whether all subprocesses are within schedule. However, in the case of Gantt charts, it applies to when a project is in progress and allows process owners to break it down into smaller tasks and cater to scheduling constraints. Contrarily, the PERT diagram is applicable at the beginning to plan and determine task durations.

Figure 10.

Gantt Charts



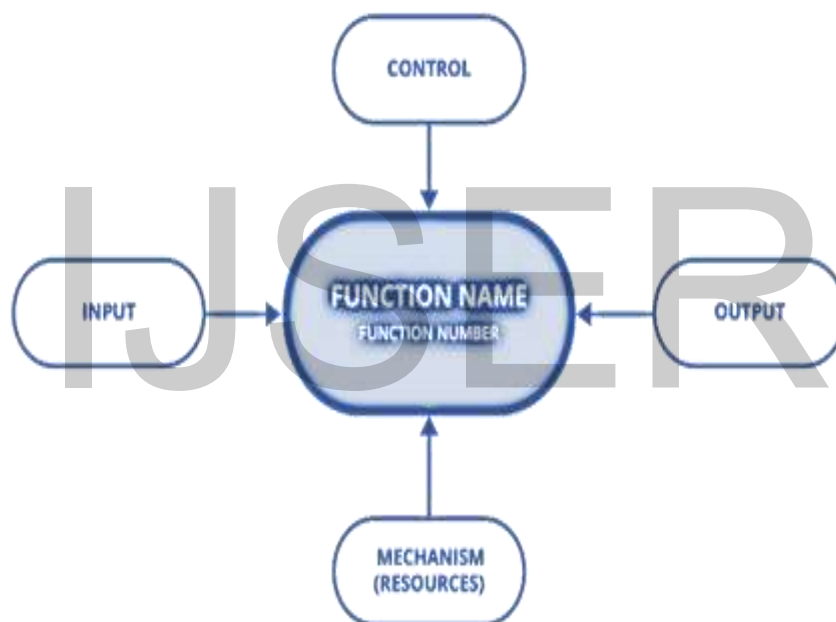
Notes: Adapted from Advantages of PERT charts vs. Gantt charts. <https://www.lucidchart.com/blog/advantages-of-pert-charts-vs-gantt-charts>. Copyright 2021 by Lucid Software Inc.

2.9 Integrated Definite for Function (IDEF)

Another technique in BPM is the Integrated Define of Function (IDEF) which also has a peculiar language set like its counterparts known as IDEF3 (Dumas et al., 2013). IDEF illustrates when primary (parent) activities give rise to secondary (child) diagrams (figure 11). There are close to fifteen forms of IDEF, and each speaks to different flows for functions, information, simulation designs, process description, and data.

Figure 11.

Integrated Define for Function Modeling



Notes: Adapted from 10 Business Process Modelling Techniques Explained, with examples.

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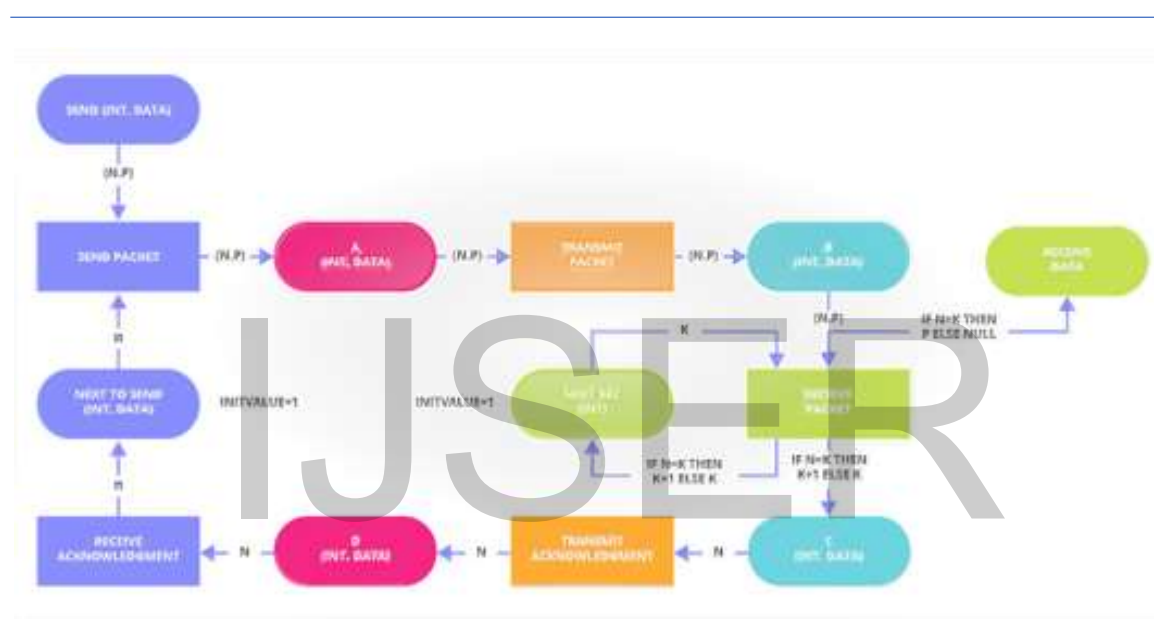
2.10 Petri Nets and Colored Petri Nets (CPNs)

Petri Nets are unique because they represent a state such as passive, unset, or waiting and action, such as receiving, sending, or transmitting in one holistic diagram. Colored Petri Nets are

applicable when a system has numerous processes that are synchronous. In this moment of synchronization, the Petri nets designs specify, simulate, and verify systems. Lastly, the colored version uses the colors to differentiate symbols and use formal mathematical notations with defined syntax (GetSmarter, 2020) (figure 12).

Figure 12.

Petri Nets and Colored Petri Nets (CPNs)



Notes: Adapted from 10 Business Process Modelling Techniques Explained, with examples.

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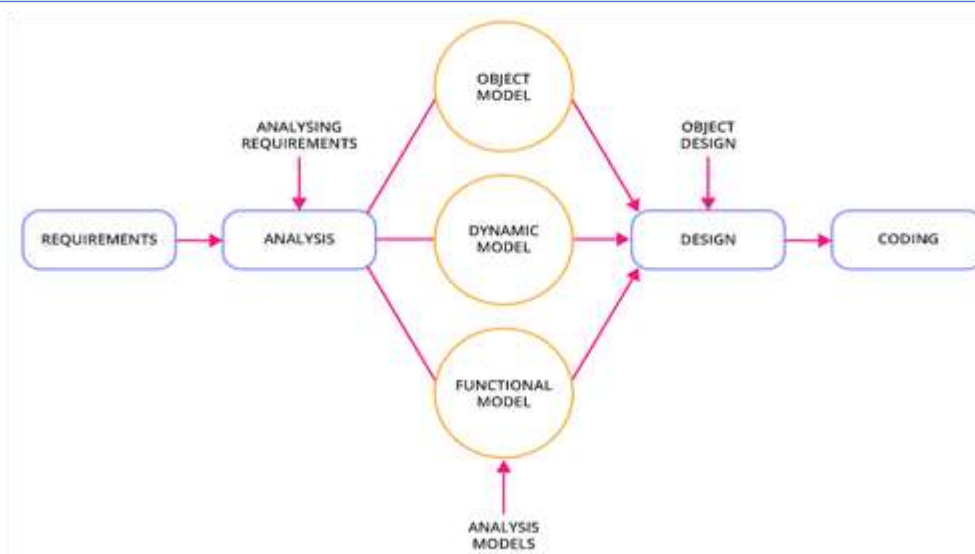
GetSmarter.

2.11 Object-Oriented Programming (OOP) Method

Compared to other techniques above, the Object-oriented Programming (OOP) method encapsulates message-passing where internal details are inherent from class to subclass. Additionally, the technique exercises polymorphism where the same process operates using different data types (GetSmarter, 2020). Additionally, the OOP methodology is sometimes referenced as Object-Oriented Method (OOM) but professes the same ideologies and applications.

Figure 13.

Object-Oriented Programming Method



Notes: Adapted from 10 Business Process Modelling Techniques Explained, with examples.

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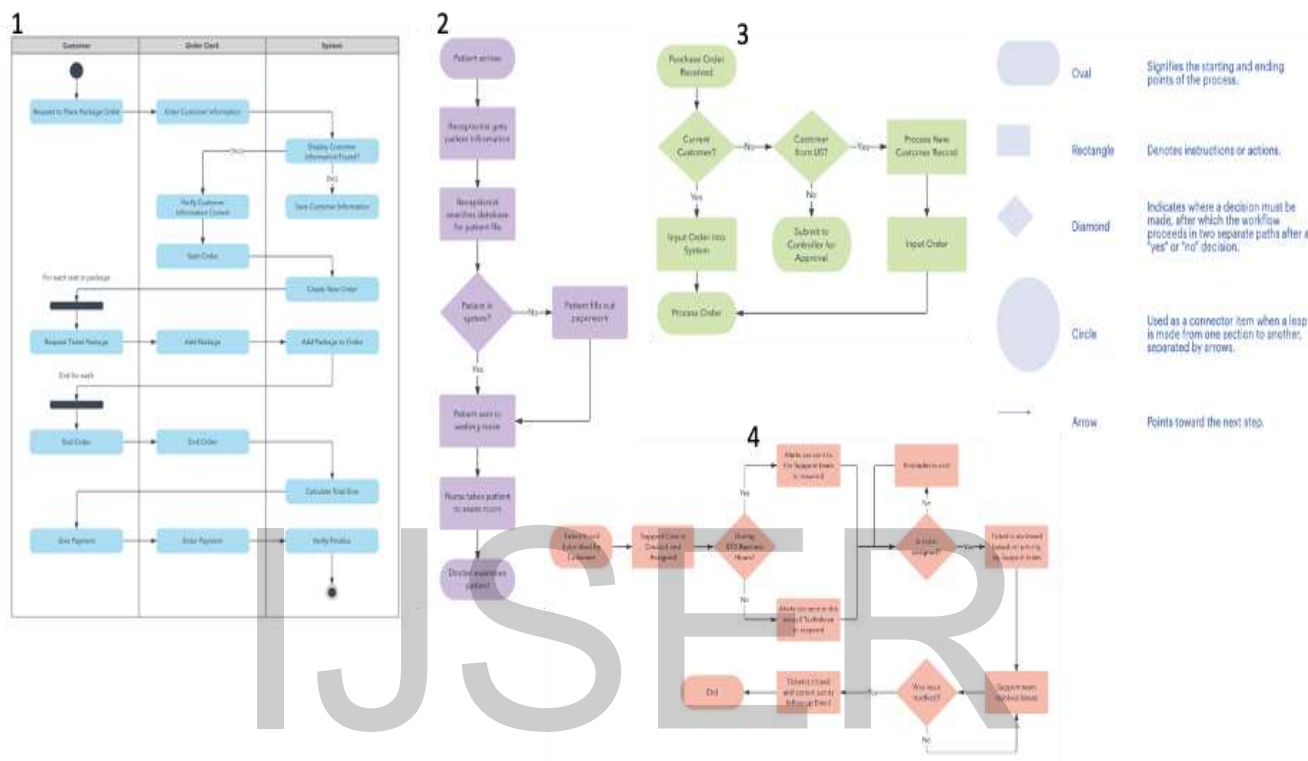
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2.12 Workflow technique

Workflows or workflow diagrams are a pictorial representation of business processes. It utilizes standardized symbols and shapes like the methods prior. However, the workflow depicts step-by-step dictations of how the work will conclude from end to end (figure 14). Jointly, it shows owners responsible for specific work and at what intervals (Lucid, 2021). When designing a workflow, an analysis must pre-define, standardize, and identify critical points. The ease of comprehension allows all stakeholders to understand respective roles and sequence to execute work or processes. Workflows take a variety of designs and form the foundation for some of the more dominant techniques and authorizing bodies prior, like BPMN, UML, and American National Standards Institute (ANSI) for workflow language.

Figure 14.

Workflow Diagram



Notes: Adapted from What is a workflow diagram. <https://www.lucidchart.com/pages/tutorial/workflow-diagram>.

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As business processes become more digitalized, organizations seek various ways to improve workflow processes outside the generic business process management/re-engineering methodologies, such as Six-Sigma, Total Quality Management (TQM), Lean Systems, and Theory of Constraints (TOC). However, this paper will continue its focus on the interdependencies of digital transformation and the overarching concept of business process management.

Chapter 3

Business Process Management and Digital Transformation

In every ecosystem lies a symbiotic relationship with some form of mutualistic benefits among two or more species. Similarly, in the business environment, business concepts exhibit the same type of relationships. However, unlike nature, it requires a more profound understanding to unearth all gains and duplicate them across different business ecosystems. In this chapter, the report examines business process management and its relationship with digital transformation. This holistic view will provide insights into the interdependencies and lead to prescript methodologies to enhance, replicate and sustain beneficial elements.

3.1 Digital Transformation

According to Boulton (2021), digital transformation epitomizes the rethinking of how organizations utilize technology, processes, and people to pursue new business models and requisite revenues driven by responding to changing customer expectations. Boulton (2021) argues that digital transformation, in reality, is a foundational adjustment to how organizations provide value to their customers. Strategically, digital transformation encompasses implementing new and emerging technologies and processes to improve business operations and customer satisfaction. Instances such as the Covid-19 pandemic of the 2020s initiated a new digital transformation focus due to its restrictive consequence of movement and economic lockdowns.

Consequently, business proves to be a continuous and never-ending cycle for some. Global brands like Best Buy, Home Depot, Nike, and Microsoft successfully transition along the journey towards transformation. Nike, for example, enlists transformative initiatives to digitally transform the business mindset, supply chains, and brand to connect with the transforming customer base. They are improving data analytics, e-commerce, and digital marketing to build direct customer sales potential. This change results in more efficient and effective utilization of the digital consumer data for Nike. This access to data allows Nike to change the way. They meet the consumer such as Nike concept stores, Nike “do it.” Online stores and fitness applications (GameLearn, 2021).

Coincidentally, Microsoft, a technology giant lauded for its innovative gains in Windows operating system, Office suits, and other products also explores the digital transformation journey. Microsoft experiences increase competition from other emerging technology giants like Apple, Amazon, and Google, which forces strategic rethink resulting in creating the cloud networking system that is more forward-thinking in its focus. Moving away from physical hardware provisions to cloud systems gave fluidity for all its consumers, and leveraging other software companies need to transform equally. Harnessing such internal capabilities gives Microsoft the added leverage to digitally transform holistically and support the process for similar activities across the globe (GameLearn, 2021).

While digital transformation appears appealing, it is not straightforward. To realize transformation, companies must align objectives with business goals, understand the criticality of co-creating through information technology and business, pick suitable strategic partners, retrain employees to think digitally, and re-engineer business processes, products, and services across customer outcomes (Boulton, 2021). Simultaneously digitally transforming companies must ensure transition with new and emerging technology through process re-design and specialized talent. This support comes from integrating process analysis, software engineers/developers, computing specialists, digital and information managers, data scientists, and architects along the transformation journey.

The digital business environment seeks to create and enhance value configuration within organizations. This configuration is a consequence of depicting how value-outcomes become a reality for the consumer and digital strategies built to create value. Such strategies must idealize the shape of the digital process in developing services, market, and commerce platforms, procedures, and competencies in an emerging digital environment.

Essentially, to grow in tandem with an emerging digital environment, businesses must grow, and such growth comes at the aid of digital transformation irrespective of individual company objectives. Critical thoughts supporting digital transformation growth include the market expecting on-demand service, workforce digital re-education and competencies are critical, information security is the priority, strength of strategic partnerships, and quicker, more efficient business and operating decisions (Cooper, 2021).

Given the emergence and relatively increasing relevance of digital innovation and transformation of business models, how do BPM practitioners genuinely feel about these trends? In a survey done in Europe against the backdrop of one-hundred and fifty (150), BPM practitioners highlight a greater need for understanding the use cases of BPM and digital innovation (Grisold et al., 2021). The survey points out that practitioners believe that theories lack exhaustive exploration into the role of BPM in innovation. In addition, BMP theories need more empirical evidence to integrate into planning projects and include those theoretical perspectives that indicate the role of structures in enabling digital transformation and BPM.

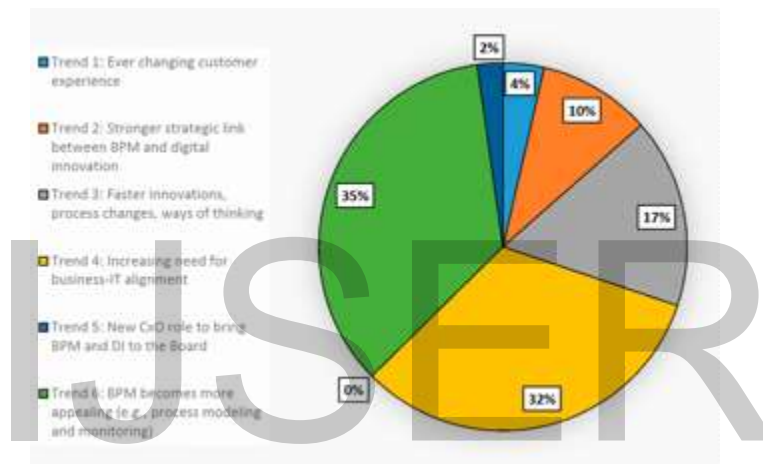
A similar article by Ahmad and Van Looy (2020) highlights that practitioners agree that the digital economy is transforming and creating opportunities for business process improvement. Coincidentally, it supports the previous study that governing bodies need to establish theoretical documentation referencing trends in BPM's technological evolution. Additionally, the survey lists and illustrates the current distribution of studies supporting these trends using a sample size of two hundred and twenty-two academic research documents (figure 15) (Ahmad & Van Looy, 2020):

1. The increasing dynamism of customer experience.
2. Developing strategic links between BPM and digital innovation/transformation.
3. Faster innovativeness, process changes, and ways of work.
4. Increasing need for alignment and co-creation between business and IT

5. Creation of new senior roles to lead BPM and transformation initiatives
6. The increasing appeal of BPM modeling and monitoring techniques

Figure 15.

Research Contributions against BPM and Digital trends



Notes: Adapted from Business Process Management Business Process Management & Digital Innovations: A Systematic Literature Review by Ahmed T., Van Looy A. Copyright 2020 by Tahir Ahmad and Amy Van Looy.

Irrespective of the expressive requests for further academic research by BPM practitioners, digital innovation appears to be the future state of business models and processes. Interestingly, the survey supports more studies supporting the need for BPM in digital business and the increased need to align BPM practices with information technology. Thus, to anticipate the move from current to future state businesses, BPM practitioners and specialists must understand how BPM drives digital transformation, its impact on the evolution of BPM, and the opportunities and challenges that must be understood.

3.2 Driving Digital Transformation through Business Process Management

In the preceding sections, the chapter explores the growth in technology and the views of BPM practitioners as it relates to the general considerations as it continues to grow. However, these emerging technologies need to become purpose-driven businesses and operation strategies as old models become obsolete. As this paper covers BPM, it highlights that it converges performance and process-related efficiencies that improve business outcomes. Given the holistic nature of BPM, it uncovers use cases for digital transformation, intelligent applications, process improvements, and application composition, to name a few.

According to Amit Ghosh (2017), digital transformation depends on several drivers. These factors include customer behavioral patterns, technological innovations, demand, and extraneous factors. Similarly, Ghosh (2017) explains that it is impossible to digitalize a business unless it thoroughly understands the customer's demand to establish a digital transformation. There must be knowledge of the processes capable of digitalization driven by BPM. Additionally, Ghosh (2017) argues that BPM is the company's nervous system as no company exists without process management.

Amaral (2019) argues that digital transformation must begin with minor improvements to provide a solid framework for the digital journey. However, for the fundamental digitalization steps, process modeling must be all-encompassing. Therefore, to remain competitive, businesses must determine how business processes can be digitized and where digitalization leads to the complete digital transformation of business practices. Process automation lies at the heart of BPM, and integrating systems for improvement becomes the focus (Amaral, 2019). Using the languages available in BPM generates the ability to orchestrate systems, machines, and people to realize better business outcomes. Amaral (2019) also indicates that implementing process automation through BPM provides the ability to:

- Streamline processes through different information systems.

- Gain insights on combining varying data sources
- Add transparency to operations and improve integrity.
- Increase process execution adherence
- Reduce costs.

By developing the right building blocks, digital transformation can become a reality, and incremental process improvements drive business development through these blocks. There are numerous examples of companies that have either been on the journey towards digital transformation through digital process improvements or practice BPM as a digital company. Kirchmer and Franz (2017) highlight that BMP not only drives digital innovation but can also monitor and maintain it at different levels within the digital organization. In figure 16, Kichmer and Franzsome highlight several companies that engage in digital innovative business process applications.

Figure 16.

Business Process Innovation Examples



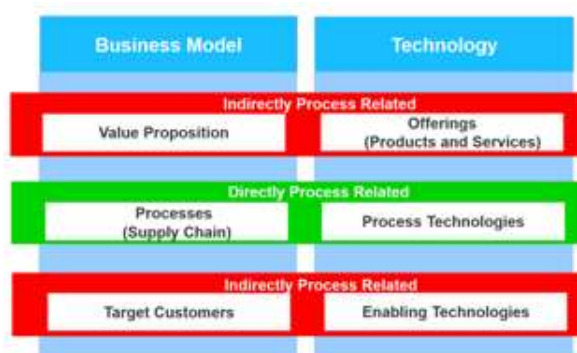
Notes: Adapted from Innovation through Business Process Management-Competing Successfully in a Digital World by Kirchmer M., and Franz P. Copyright 2017 by BPM-Discipline Assets, L.P.

As a precursor to understanding how BPM drives digital transformation, it is necessary to highlight that business process innovation through BPM has two forms. The first is business model innovation and technological innovation (Kirchmer & Franz, 2017). Model innovation includes new value propositions, processes, and consumer markets. Dell, for example, did not invent supply chain management but spent time to develop new businesses processes to bring products to the market, eliminating steps and providing flexibility and control. Amazon did not invent the book but the process for buying books online, which later evolved using the internet to become a broader online retailer and one of the most valuable digital businesses globally (Kirchmer & Franz, 2017). Likewise, eBay automates the auction process to make it easy to use and, in turn, encourage the popularity of the auction process. This innovation gave rise to a new type of business. Additionally, LinkedIn and Facebook found promise in new processes for developing and managing relationships through personal networks.

Traditional companies in industries like Airline, Electronics, Banking, and Machinery transition to convenient and reliable service processed utilizing the internet. Financial institutions reduce costs and improve service levels through offering online banking processes. Airlines transform the ticketing process to reduce cost and stabilize processing times. Accordingly, electronic companies like Apple Inc. transition to areas of content provision, re-selling (streaming) music, and digital content (Kirchmer & Franz, 2017). The power of process innovation through BPM is numerous, and examining industries globally provides evidence of transformation through process innovation.

Figure 17

Levers of Innovation

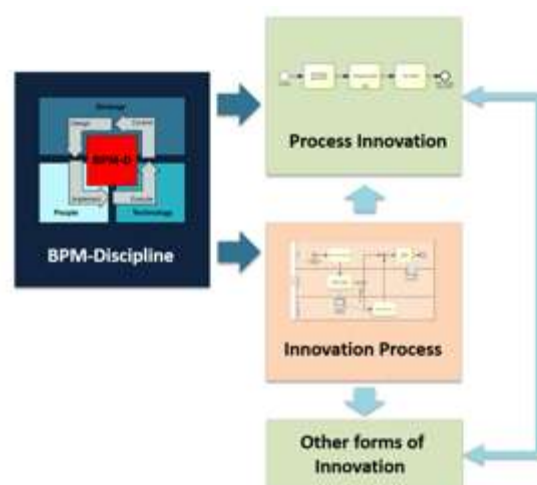


Notes: Adapted from Innovation through Business Process Management-Competing Successfully in a Digital World by Kirchmer M., and Franz P. Copyright 2017 by BPM-Discipline Assets, L.P.

Does BPM genuinely enable digital transformation? According to Kirchmer and Franz (2017), the relationship is evident in various innovation theories applicable in practice, such as Christensen's Value Chain Evolution theory and the Resources, Processes, Values theory. Synchronously, Kirchmer and Franz (2017) explain that any new or modified business process is an innovation, including new structures, new processes, accuracy, granular and fast data, new functions, and new organizational responsibilities superior process deliverables. Figure 17 illustrates these levers of innovation and their relationship to the business process.

Figure 18.

Value-driven BPM-Discipline on Innovation



Notes: Adapted from Innovation through Business Process Management-Competing Successfully in a Digital World by Kirchmer M., and Franz P. Copyright 2017 by BPM-Discipline Assets, L.P.

The discipline of value-driven BPM delivers transparency and agility to enable innovation, especially in areas that lead to business model innovation (digital transformation) (Kirchmer & Franz, 2017). BPM sets the parameter for quick and flexible responses to changes proactively. Additionally, BPM identifies the high-impact process that innovation matters and targets the activities that can gain the most value. BPM enables freedom to innovate through agility, creativity, and the development of new ideas (figure 18). Through the agility of BPM, innovation can occur rapidly; likewise, its implementation to drive improvements. Correspondingly, BPM treats innovation as its critical value driver for instilling change.

3.3 Evolution of Business Process Management due to Digital Transformation

To effectively understand how BPM is evolving because of digital transformation, it is relevant to investigate across two (2) spheres. The emergence of digital businesses (e-business) and the innovation of BPM practices due to digitalization. With the inherent focus to improve how companies do cross-functional work and ensure company-wide capabilities to enable effective management of business processes, BPM must continue to evolve. With the uptake of digital technologies and focus going beyond process automation, BPM approaches are changing to match those needs (Kerpedzhiev & Roglinger, 2017).

Emerging technologies enable unimaginable business processes, and as a result, are a paradigm shift for BPM. As companies invest time and capital into IOT, blockchain, machine learning, and artificial intelligence, business processes become data-intensive and complex. This complexity is due to the need for real-time data assessments and decision-making along with business processes. In a business environment where advances in process automation and digital process designs are dominant, a reactive problem-solving approach to BPM is no longer viable (Kerpedzhiev & Roglinger, 2017). BPM, in this case, needs to become ambidextrous by leveraging technologies for rationalizing and revolutionizing business processes in digital organizations.

Additionally, Kerpedzhiev and Roglinger (2017) indicate that BPM must enable businesses to handle unpredictable, fragmented, cross-organizational, knowledge-intensive business processes parallel to the digital environment. The results of a study done with thirty (30) BMP academic experts highlight the ideal BPM framework for the digital business (figure 19). The basis of this framework provides thirty (30) capabilities that integrate with the core concepts and elements of BPM, strategic alignment, governance information technology, culture, and people (Kerpedzhiev & Roglinger, 2017).

Figure 19.

Capabilities Framework for BPM in a Digital Environment

Strategic Alignment		Governance		Methods / Information Technology		People		Culture		Factors
Strategic BPM Alignment	Contextual BPM Governance	Process Context Management	Multi-purpose Process Design	BPM and Process Literacy	Process Centricity					Capability Areas
Strategic Process Alignment	Contextual Process Governance	Process Compliance Management	Advanced Process Automation	Data Literacy	Evidence Centricity					
Process Positioning	Process Architecture Governance	Process Architecture Management	Adaptive Process Execution	Innovation Literacy	Change Centricity					
Process Customer and Stakeholder Alignment	Process Data Governance	Process Data Analytics	Agile Process Improvement	Customer Literacy	Customer Centricity					
Process Portfolio Management	Roles and Responsibilities	BPM Platform Integration	Transformational Process Improvement	Digital Literacy	Employee Centricity					

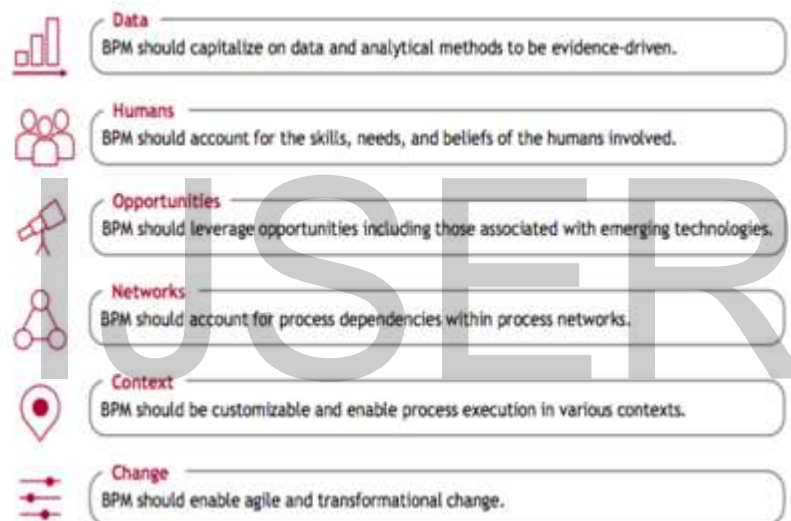
Notes: Adapted from Business Process Management in the Digital Age by Kerpedzhiev, K. and Roglinger, R. 2017. Copyright 2021 by BPTrends.

Concurrent to the capabilities framework above, BPM and business processes need to align with business objectives and goals. Furthermore, information technology and methodologies in the

digital environment have a high need for BPM, and business processes need to be the central unit (nervous system) of analysis in management. In retrospect, BPM must exploit current capabilities while exploring new ones by embracing six (6) themes across data, opportunities, people, networks, change, and concepts (figure 20).

Figure 20.

Themes of BPM in a Digital Environment



Notes: Adapted from Business Process Management in the Digital Age by Kerpedzhiev, K. and Roglinger, R. 2017 Copyright 2021 by BPTrends.

Notwithstanding theoretical process improvements in BPM, Melao (2009) argues that BPM phases enable the role of information technology and improve business processes. Interestingly, it recognizes that BPM is best suited for e-businesses both holistically and systematically. Considering this, Melao (2009) cites that the e-business matures over time to what he refers to as e-business process management, which unequivocally displays the evolution of BPM (figure 21).

In addition to conceptual modifications of BMP in a digital environment, BMP has systematically transformed by optimizing technology and enterprise processes through business process automation. This demand for automation forces improvement in processes, accuracy, efficiency, compliance, and visibility. Growing emphasis on automation within BMP gives birth to BMP software (BMPS), an enterprise-level innovative software solution to automate repetitive tasks, manage fundamental processing and process logic (Hyland, 2021). Hyland (2021) also highlights the dominant features of a BPMS to include form builders to collect, display, and route data, workflow automation for assigning tasks, rules, and deadlines.

Figure 21.

The Evolution into E-Business Process Management



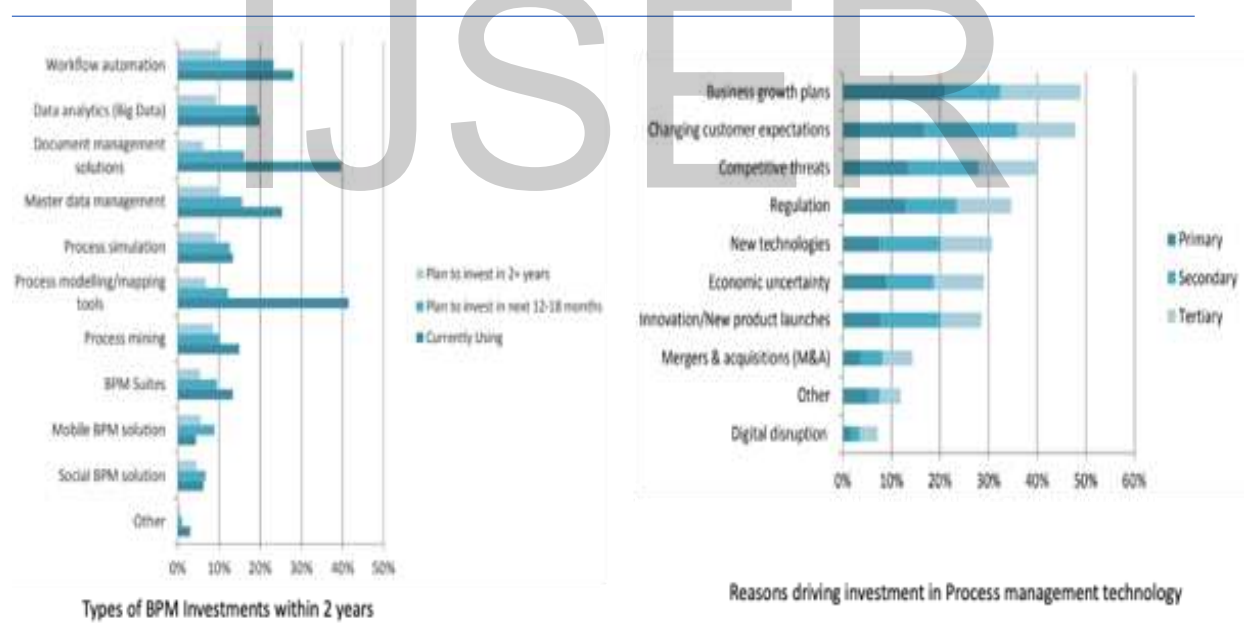
Notes: Adapted from E-Business processes and e-Business Process Modeling: a state-of-the-art overview by Melao, N. International Journal of Services Technology and Management. Copyright 2009 by Inderscience Enterprise Ltd.

Approval processes for documentation and evaluation, customizable notification and alerts relating to tasks, and process drafting for visual interfacing. In addition to activity monitoring, software integrability, role controls, performance metrics, and monitoring. Undoubtedly, BPM is evolving conceptually and in technique to respond to digitally transforming business environment needs.

Assuredly, it is worth noting that numerous industries are claiming to invest large amounts into automating processes and BPM-related technologies. An article on Process Network Excellence (2018) highlights a survey of nine hundred (900) BMP professionals, which shows considerable interest in the technological future of BPM. Interestingly, the same survey illustrates the same interest by reason, indicating a comprehensive perspective of interest and investment probabilities across economic environments (figure 22).

Figure 22.

Invests levels in Business Process Management Software



Notes: Adapted from Who is investing in Business Process Management (BPM) Technology? 2018 By Process Excellence Network. Copyright 2021 by Inderscience Enterprise Ltd.

Nevertheless, are there conceptual challenges and opportunities that need exploration to understand the whole gamete of interconnectivity between digital transformation and BPM? The following section will reconnoiter academic ideologies worthy of consideration.

3. 4 Associated Challenges and Opportunities considering Digital transformation

There are three schools of focus when it comes to considering digital transformation and innovations within the realm of BPM (Grisold et al., 2021). First, the opportunities and challenges encountered by understanding the role of BPM in the digital transformation process. Secondly, the scope of transformational activities within BPM initiatives and the aligning of organizational structures to realize digital transformation through BPM. Figure 23 highlights the relative challenges and associated opportunities relating to each school of focus.

Figure 23.

Summary of Challenges and Opportunities

Focus	Associated Opportunities	BPM Challenges with Digital Transformation/Innovation
Exploration of the role of BPM in Digital transformation	<ol style="list-style-type: none"> 1. BMP can play an enablers role in digital transformation (descriptive and prescriptive) 2. Explorative BPM allows to for integrating emerging technology opportunities into business processes 	<ol style="list-style-type: none"> 1. Limitations with respect to awareness of the enabling role of BPM in digital transformation 2. BPM discourse is concerned with exploitive BPM
Scope transformative activities within BPM initiatives	<ol style="list-style-type: none"> 1. Greater understanding and demonstrating of how digital innovations and transformations can support BPM activities 2. Increase availability of appropriate BPM frameworks, methods and tools that consider digital transformation 	<ol style="list-style-type: none"> 1. Practitions lack full guidance on integration of digital transformative activities into BPM Projects 2. There are no standard procedures as to how to manage BPM projects in relation to Digital transformation
Aligning structures to realize digital transformation through BPM	<ol style="list-style-type: none"> 1. Define and describe capabilities necessary to enable BPM for digital transformation 2. Promotes innovative mindest and logistics throughout the BPM stratosphere 	<ol style="list-style-type: none"> 1. Lack of detail guidance on how to develop and integrate rellevant competencies 2. Incoherent role of mindset in relation to digital innovation.

Notes: Adapted from Digital Innovation and Business Process Management: Opportunities and Challenges as Perceived by Practitioners. Grisold et al., 2021, Communications of the Association for Information Systems.

Throughout this section, evidence supports the relationships between BPM and digital transformation at differing touchpoints. Conversely, surveys indicate the need for more academic

standards and support from a governing standpoint, irrespective of value-added interdependencies. The next chapter discusses recommendations for utilizing BPM concepts in a digitally transforming business environment while providing a conceptual synopsis of their peculiar relationship.

Chapter 4

Recommendations and Conclusion

Merriam- Webster (2021) defines interdependence as a state of being dependent on another for mutual benefits, including two or more sources. From this perspective, evidence throughout this report supports interdependencies between business process management and digital transformation. However, the nature of the relationship is twofold in that it predicates cause and effect proponents through co-creation. Despite this relationship, business process management practitioners and businesses engaging in digital transformation must consider several recommendations for generating growth and digital dominance.

Firstly, in practicality, there is a greater need to focus on corporate strategy and process innovation. Previous sections note that business processes must be at the core of innovation, which drives new products and services. Once organizations define financial and digital strategies, the business process management process is critical to enhancing activities and capabilities to drive success. Additionally, as a precondition to BPM, professionals should accept that digital innovation exists throughout process management. With the convergence evident, the ambidexterity of business process management is critical to its application for digitally transforming business processes. It is also essential that businesses and BPM practitioners understand the role digital technologies play in process innovation; technology fosters digital enhancements through their applicability.

Concurrently, applying practical use cases to understand best practices as it relates to connecting business process management and innovative change is the basis for every approach. Use

cases span Amazon, Nike, General Motors, Dell, to name a few. However, consider Adidas GV company's BPM success story (Pilecka, 2013). The case highlights the selection of value-added projects that initiate innovation that creates simplicity and growth. The author also emphasizes the need to turbocharge the BPM process to respond and execute quickly. Pilecka also exclaims that Adidas encourages businesses and practitioners to engage information technology specialists in process improvement and re-engineering initiatives while continuously educating and communicating process impacts and digital heuristics.

On the premise of continuous education, it is evident that there is still much to learn regarding the cause-and-effect relationship between the two schools of activities. As such further research is essential to empirically and theoretically address the interrelatedness. Governing bodies of process management and academics should emphasize exploring and documenting the role of digital innovation from a causative perspective. Theoretical and academic documentation is critical as it provides an understanding of the criteriums necessary to initiate transformation through BPM and not coincidentally encourage innovation. Unquestionably, there is an inherent need for scope definitions for digital innovation activities within business process management initiatives. Process management standards require new levels of inclusiveness as it relates to digitalization and digital transformation initiatives to provide practitioners and businesses with a journey plan for action and monitoring procedures to evaluate effectiveness. In support of the corporate strategy, there needs to be a definition framework for aligning organizational structures to encourage digital innovation through BPM. Through this framework, practitioners will develop and bundle organizational competencies to initiate and support innovative initiatives.

In conclusion, there is considerable evidence in practicality that business process management and digital transformation share interdependencies, which supports an accurate ("true") result for the hypothesis that there is an underlying cause and effect relationship. Moreover, the success of digital organizations depends on the appropriate process improvement strategies that

BPM offers along with the other process improvements techniques. While much research is still pending, it underscores the relevance of understanding said interdependencies to provide structure to the digital transformation phenomenon. Given the recommendations above, practitioners and process owners must act as enablers to drive and adapt business process management to a digitally evolving business environment. Finally, process innovation, re-design, re-engineering, and digital transformation is not a singular co-creation event but a continuous and ever-evolving cycle that needs consistent circumspection.

List of Acronyms

Acronym	Definition
ANSI	American National Standards Institute
AI	Artificial Intelligence
BPM	Business Process Management
BPMN	Business Process Modelling Notation
BPMN2.0	Business Process Modelling Notation 2.0 (upgraded language)
BPMS	Business Process Management Systems
CPN	Colored Petri Nets
DFD	Data Flow Diagrams
HR	Human Resources
IDEF	Integrated Definition of Function
IT	Information Technology
IOT	Internet of Things
LLC	Limited Liability Company

OMG	Object Management Group
OOP	Object-Oriented Programming
OOM	Object-Oriented Methods
PERT	Program Evaluation and Review Techniques
RADs	Role Activity Diagrams
TOC	Theory of Constraint
TQM	Total Quality Management

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