

## A Grounded Theory Approach to Digital Transformation in the Postal Sector in Southern Africa

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### ABSTRACT

*This paper describes a qualitative research design adopted in this study guided by deployment of a Grounded Theory (GT) methodology which was deployed to synthesize literature on technology adoption and digital transformation with an objective of developing theory. The philosophical worldview adopted was interpretivism/constructivist of a qualitative grounded theory inductive (theory building) approach where secondary data was sourced from industry reports and related academic peer reviewed literature. The grounded theory method was used to synthesize data which resulted in emergent dimensions that underpin digital transformation and technology adoption in the postal sector in the context of Southern Africa. The careful and laborious method of theoretical sampling, constant comparison and theoretical coding which underpins grounded theory research ensued in thirteen dimensions which were further advanced until theoretical saturation was established, the theoretical saturation resulted with emergence of the ten themes reinforced by constructs/concepts with associated allocated codes. The ten themes that emerged from the grounded theory research are adoption, shared vision, digital competitiveness, digital ecosystem, digital capability, digital investment, diverging interests, customer insights, digital culture, and operational efficiency. These emergent themes are the basis of the next leg of the research which is to develop a dynamic model archetypical of the digital embracing dynamics in the postal service in Southern Africa employing the System Dynamics modelling approach.*

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### 1. Introduction

The world is on the crossover to the digital era, which is transforming society and organizations across the world, an era also known as the Fourth Industrial Revolution. Digitalization is greatly plummeting the expenses of amassing, stockpiling, and administering data, thus altering commercial endeavours globally. Digital technologies provide opportunities to business, especially those in emerging economies, to take part international trade through e-commerce. This new digital revolution also known as the Fourth Industrial Revolution or its application in industry (Industry 4.0) requires alterations to current governance frameworks and has enormous repercussions for the Posts in the digital age [1].

In [2], the authors argue that Industry 4.0 can be well-defined as the innovative digital transformation for intuitive systems based on the astounding increase of the swiftness of information

managing, digital warehousing competence and immense advancement of information and communication technologies (ICT). The term "Industry 4.0" means the smart plants in which smart digitally enhanced devices remotely connected to enable communication of resources and materials through the business value-chain. This phenomenon is typified by responsiveness, proficiencies and efficiency [3].

Industry 4.0 is defined as a technology-based revolution, the emphasis being on autonomous systems with capacity and capability for quick information processing, big data storing capacity and capability and exponential increase in complex information and communication technologies (ICT) [2].

In [4], the authors postulates that Digital transformation (DT) can be characterized as an industry process developed to integrate digital technologies by synchronously streamlining business processes, goods, services, constructs, and company business models. Digital transformation originates from the collective

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impacts of numerous digital innovations generated about novel players, structures, traditions, principles, and views that alter, jeopardize, replace or support prevailing guidelines of the way things are done within organizations, networks, businesses or turfs [5].

In [6], the authors advance that DT is understood as an assorted technology-based transformation in the firms that includes both the application of 21<sup>st</sup> era technologies to enhance standing processes and their efficiency, and the adventure into digital innovation, which possess the potential to transmute the business model of an organization. It has been demonstrated in the introductory section that the digital age and the ensuing transformative processes championed by the concept of DT are related with vigour, intricacy, and novelty and as a result a unique methodology is proposed to study the factors (barriers/inhibitors and drivers/enablers) associated with this phenomenon that continues to disrupt the world and shape the future.

This research paper adopted an inductive logic (theory building) approaches, this research will seek to comprehend critical inhibitors and enablers that play a role in technology and DT embracing in the postal service in the Region (Southern Africa) through analysis of secondary data from academic literature and industry reports. The theory building (inductive logic) will be conducted through Grounded Theory Research to solicit insights on the drivers and barriers of DT in the postal industry in Southern Africa.

In [7], the authors propose that Grounded theory (GT) has gradually surfaced as a renowned approach in social research for qualitatively investigating vibrant (dynamic) and unfamiliar phenomena. In [8] the authors reinforce this perspective and suggest that in the preceding two decades, an advance in curiosity in the field of grounded theory has been observed in the field of information system (IS). Digital transformation can be correlated to information systems which are a “component” of digital transformation relating to digitalization which must not be confused with digitization.

### *1.1. Problem statement*

Conventional quantitative-based approaches are not able to fully delve into a phenomenon characterized by rapid change, dynamism, intricacy brought by multiple stakeholders with often conflicting interests and newness of the concept. The rigidity of traditional logico-deductive quantitative approaches makes it difficult to fully comprehend the era of the digital age and its bearing on the way postal services operate on the global arena and for the purposes of this research; the postal service in the Region (Southern Africa).

### *1.2. Research question*

Can a conceptual framework be developed through a Grounded Theory research to explore the digital transformation adoption dynamics in organizations broadly and in the postal industry the Region (Southern Africa) in particular?

### *1.3. Closing notes to introduction section*

The paper is divided into (a) Introduction which introduces the topic under study as well as clearly articulating the problem to be

resolved; and the research question which steered the research. (b) Literature appraisal section which delves into the GT research approach (c) Research methodology which articulates the philosophical worldview, the research approach (inductive approach), the research design (d) Discussion and findings which delves into the drivers and barriers of technology and digital transformation, and their transformation into emergent theory which is presented as findings; and (e) Conclusions and recommendations which provides deductions from the research and provides recommendations and expanses of forthcoming research.

## **2. Literature review**

### *2.1. The Grounded Theory Research Method*

In [9], the authors argue that whereas grounded theory did not altered in technique since conception in 1967, the aspect of GT's tenets has been expounded as the method advanced in practice. The processes of GT are intended to cultivate a cohesive basket of notions that provide a thorough theoretic elucidation of social phenomena under study. GT signifies an inductive examination in which the investigator queries data presented by respondents or taken from prior annals [10]; it (grounded theory) is a qualitative process of exploration in which investigators build hypothesis or theory from data at hand [11].

In [12], the authors advance that qualitative methods exhibit a dissimilar method to studious examination than techniques of quantitative research. Even Though the techniques are alike, qualitative methods depend on writings and image data, and have unique steps in data analysis, and pull from varied blueprints. Grounded theory is dissimilar to the dominant theory testing methods of investigation because, instead of beginning with a theory and systematically observing evidence to confirm the theory; grounded theory researchers on the other hand amass information and meticulously develop a mid-range purposeful theory grounded on that information amassed [11].

In [13], the authors elucidate that GT method entails a adaptable, yet distinctive, plans that differentiate it from other qualitative approaches, and it (GT) is chiefly relevant in greatly dynamic circumstances encompassing prompt and substantial change [10]. The unique characteristic of grounded theory is that it does not commence with a theory but instead extracts one from whatever emerges from an area of study [10]. This view is reinforced by [9] who propose that GT possess precise techniques for data gathering and assessment, while there is agility and leeway within boundaries; and GT scholar must understand these processes and related principles to be able to execute a study and these tenets are:

- (a) Data collection, and analysis are interrelated activities: In GT, the evaluation commences immediately when the preliminary set of data is gathered.
- (b) Notions (concepts) are the fundamental elements of analysis: A scholar operates with synthesis of data, not the with rudimentary data per se.
- (c) Groupings (categories) ought to be created and associated: Notions that correlate to the same fact may be assembled to form classifications (categories). Not all theories become groupings (categories). These categories ought to be elevated

in level and more conceptual than the notions (concepts) they express.

- (d) Selection (sampling) in GT progresses on theoretic grounds: Sampling in GT continues not in traction of extracting samples of specific clusters of people, time dimensions, but relates to notions (theories, concepts), their characteristics, extents, and differences.
- (e) Examination (assessment, analysis) employ a process of continuous contrasting: As a concept is observed, it is contrasted alongside further concepts for resemblances and disparities.
- (f) Archetypes and deviations must be taken into consideration: Information must be scrutinized for evenness (sameness) and for an appreciation of where that sameness is not evident.
- (g) Method (process) should be crystallized into theory: In GT, process (method) retains numerous implications. Process analysis could require decomposing a phenomenon into smaller chunks. Process may also denote resolute deed that may not be gradual, but changes in response to prevailing conditions.
- (h) Composing theoretic memos is an essential element to undertake GT research: Because the scholar may not easily keep track up with all the categories, attributes, propositions, and proliferation of questions that advanced from the investigative process, a systematic process to keep track of the evolution of the research should be in place. The usage of memos signifies such a system. Memos are not exclusively about "ideas", instead they are part of a meticulous research process in the construction and adjustment of theory.
- (i) Propositions (hypothesis) relating to associations among groupings (categories) should be established and substantiated during the research process: As suppositions (propositions) about linkages among categories are established, feedback mechanism to the field is a key requirement to ensure the dynamics are checked against material conditions in a dynamic setting and revised as required. A pertinent characteristic of GT is not that propositions remain unconfirmed, but that propositions are incessantly examined during the research process until they are confirmed or rejected.
- (j) A GT scholar should not work in isolation: A significant part of GT method is validating notions (concepts) and their causality with peers in similar research area.
- (k) Wider underlying circumstances must be explored and scrutinized however miniscule the research is: The assessment of a dynamic setting should not be constrained to the conditions that directly influence on the phenomenon of interest. Wider drivers influencing a phenomenon under study may include political, social, economic, cultural, technological, environmental, and other related factors.

In [14], the authors argue that in context of GT, data gathering commences without the creation of a premature hypothetical context (theoretical environment). Concepts (theory) is established from data produced by sequences of reflections. Information extracted from interaction of enablers and inhibitors in a dynamic setting is the building block towards the development of forecasts which are then verified in further observations that may confirm, or otherwise, the forecasts. "Grounded theoreticians have a common view with other qualitative scholars, that the traditional

tenets of "good science" should be preserved, but require recontextualization of the approach with a view to fit the certainties of qualitative research and the intricacies of social phenomena" [9].

In [11] the authors advance that GT is illusorily unsophisticated conceptually, yet meticulous and methodical in practice. Figure 1 depicts the method of GT which can be summarized as:

- (a) A scholar initiates data collection on a phenomenon of interest and explores the data by investigating patterns of occurrences to show concepts. Concepts are the key ingredient of GT, and conceptualization is one of its distinguishing characteristics.
- (b) The theoretical attributes of a category are established by assessing instances in incoming data with prior incidences in similar category. Throughout the evaluation process, the "core category" is established. The process of breeding categories and their characteristics proceeds up to the point where categories are "saturated"; that is, when additional collection of data does not yield any fresh characteristics to the present categories.
- (c) After saturation, the significant theory is contrasted to theories depicted in the literature.
- (d) Right through the process, the researcher transcribes memos capturing his or her reflections and logical procedures; the memos boost the emergent notions, classifications, and their interactions.

In [15], the authors cites [16] who theorises that grounded theory process is typified as a spiral that commences with collecting portions of data in a noteworthy expanse of enquiry which is coded and categorised in an ceaseless process that continues towards saturation and concludes in the theoretical compaction of concepts exemplified by a substantive theory. Figure 1 illustrates the grounded theory process as theorized in [11].

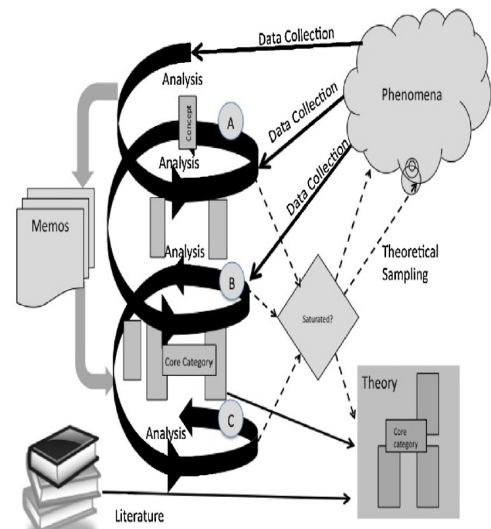


Figure 1: The Grounded Theory Method [11]

In [15], the authors further argue that while Figure 2 offers a high-level view of the process involved in grounded theory, it overlooks critical activities which include (a) Entering the field which encompasses (i) Problem explanation, and (ii) ensuring theoretical flexibility and relevance through a vigilant selection of

cases; (b) The part played by theoretical memos and extant literature in a GT study. The expanded Lehmann’s research model proposed by [15] as depicted in Figure 3.

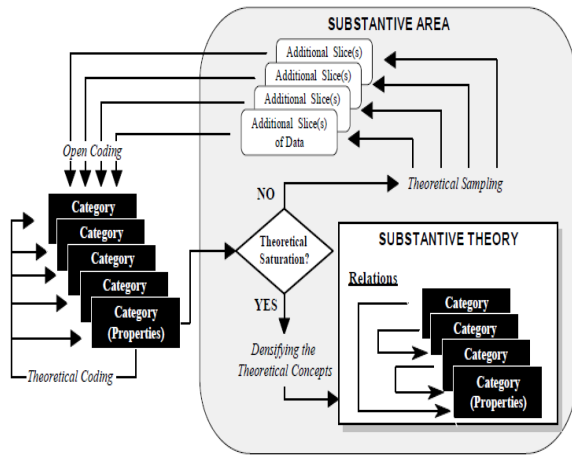


Figure 2: Lehmann’s grounded theory process [15]

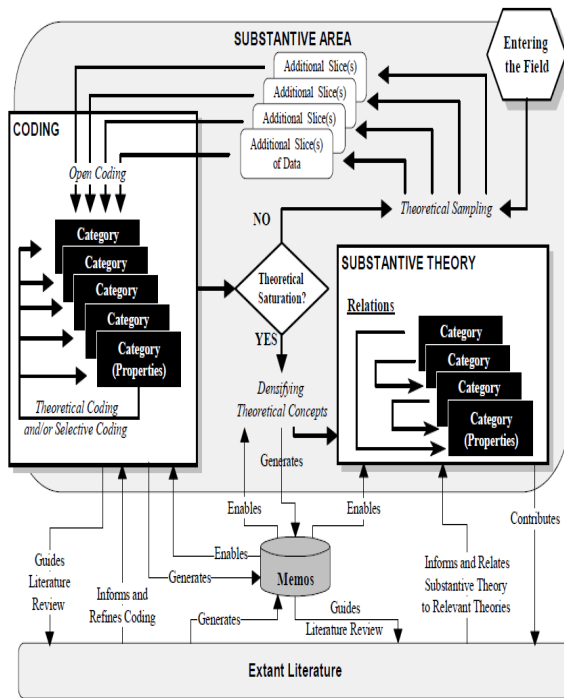


Figure 3: Expanded Lehmann’s (2001) research model [15]

This research adopted a GT research method in the exploratory stage of the study through the interaction of the researcher with secondary data on technology and digital transformation adoption in organizations largely and cascaded down to the postal sector in the international context and regional (Southern Africa) context.

### 3. Methodology

In [17], the authors advance that research is a logical and methodical examination for applicable data on a specific topic of interest. This view is reinforced by [18] who contend that research is an organized process of gathering, examining, and deciphering data with a view of growing insight about a phenomenon under

study. In [19] the authors affirms the idea that research is an essential and compelling tool in guiding mankind towards progress. “Without logical research there would have been very little progress”.

In [20] the authors proposes that another approach to research methodology development is constructed on the hypothetical concept of “research onion” proposed by [14]. The research onion delivers a comprehensive representation of the core tiers which are to be followed to devise an efficient and useful approach [21]. The research onion is depicted in Figure 4, it illustrates the layers from an all-inclusive philosophical viewpoint to the nuts and bolts of data collection and its respective analysis.

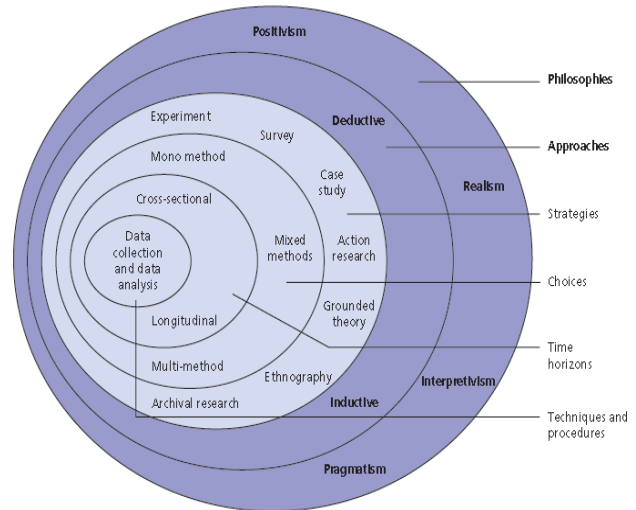


Figure 4: The research onion [14]

#### 3.1. Philosophical worldview

In [22], the author suggests that the varieties of beliefs (philosophical worldview) held by individual researchers based on these factors will often results in the scholar adopting a qualitative, quantitative, or mixed methods approach in their research. This view is supported by [23] who maintains that the type of research approach the investigator adopts is informed by the viewpoint which the scholar holds to and the viewpoint will influence the research aim, the research tools designed and applied, as well as the pursuit for the resolution to the problem the scholar is exploring. These worldviews are post-positivism, constructivism, transformative, and pragmatism [12]. The major features of the four worldviews are outlined by [12] in Table 1.

The research philosophy adopted in this study reflects the way in which the researcher’s worldview. The worldview and or viewpoint underpin the research methodology adopted.

Table 1: Major elements of the philosophical worldviews [12]

|                                |                                    |
|--------------------------------|------------------------------------|
| Positivism and Post-positivism | Constructivism/Interpretivism      |
| Absolute                       | Insight                            |
| Reductionist                   | Multi perspectives                 |
|                                | Social and historical construction |

|                                      |                    |
|--------------------------------------|--------------------|
| Observed examination and dimensions. | Concept building   |
| Concept testing                      |                    |
| Transformative                       | Pragmatism         |
| Political                            | Arise from events. |
| Power and justice oriented           | Problem-focused    |
| Concerted                            | Diverse            |
| Change-focused                       | Practical oriented |

In [14], the authors argue that realism contends a key factor of the epistemology, ontology and axiology adopted by the scholar; is the research question. Ontology is focused on kind of realism and the crux of its being [17]; [14] which entails two ontological perspectives; objective reality and subjective reality [24]. Objectivism and subjectivism can be characterized as contrasting philosophical positions associated with the two perspectives [25]. Objectivism depicts the position that social entities occur in reality outside the social actors affected with their existence [14]; [25]. Subjectivism on the other hand asserts that social phenomena are inspired from the perceptions and subsequent acts of those social actors concerned with their existence [14].

In [14], the authors argue that epistemology is the study of the essence of knowledge and how it is developed, and offers a similar dualistic contest between positivism and interpretivism. Postpositivists hold a deterministic philosophy in which causes (most likely) determine effects or consequences [12], while interpretivism steadily hold that it is vital for the scholar to grasp discrepancies between people as social actors [14]. Views of the two poles are summarised in Table 2.

Table 2: Views of the two poles of research paradigm spectrum [24]

| Paradigm     | Scientific  | Humanistic  |
|--------------|---|---|
| Ontology     | Objectivism   | Subjectivism  |
| Epistemology | Positivism  | Interpretivism (Phenomenology)  |
| Viewpoints   | <ul style="list-style-type: none"> <li>World is perceptible and precedes individuals.</li> <li>One reality</li> <li>The scholar is independent to phenomenon under study.</li> <li>Research focuses on reducing the problem to parts</li> </ul> | <ul style="list-style-type: none"> <li>World is socially constructable.</li> <li>Multiple experiences</li> <li>The investigator is part of and interacts with phenomena under study.</li> <li>Research contextualizes phenomenon</li> </ul> |

### 3.2. Research approach

In [24], the authors propose that the progression of a new theory could be attained by commissioning two research approaches, deduction as depicted in Figure 5 (a) which can be defined as a step-down process towards theory testing or induction depicted in Figure 5 (b) which could best be defined as a step-up process towards theory building.

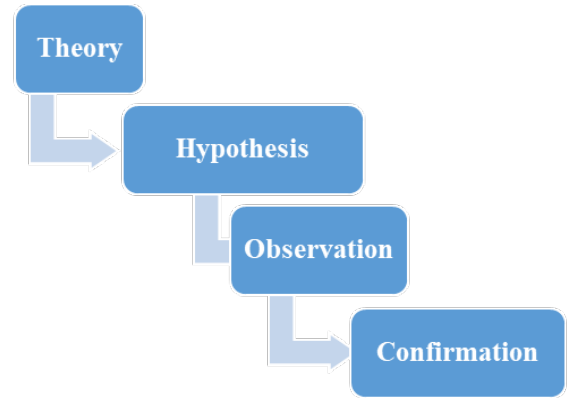


Figure 5: (a) Deduction approach: Adapted from [24]

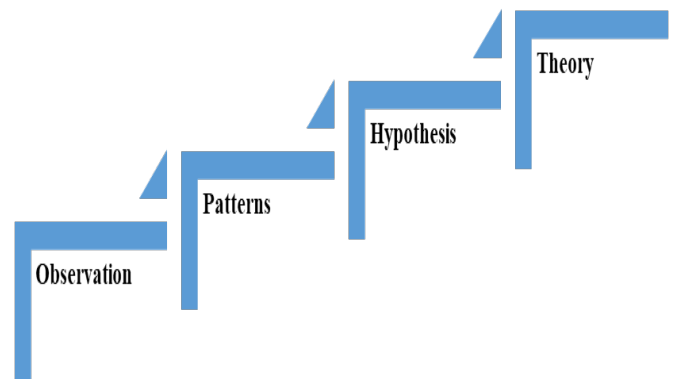


Figure 5: (b) Induction approach: Adapted from [24]

In [24] the authors contend that deduction process involves an immensely structured technique and often dissects causal relations between elements in order to describe a specific phenomenon and engender a generalizable conclusions and often referred to as the ‘top-down’ approach; inductive theory-building on the other hand commences by definite detections in which outlines and relations are unearthed to develop concept (theory) about a specific phenomenon and could best be described ‘bottom-up’ approach. The key variances between deductive and inductive approaches to research are illuminated in Table 3, while Table 4 depicts the two research approaches and their consistent characteristics which provides a unified view of precepts of both deductive and inductive research approaches.

Table 3: Major differences between deductive and inductive approaches to research [24]

| Deduction process                       | Induction process                 |
|---|-----------------------------------|
| Precise tenets.                         | Gaining insight                   |
| Shifting from notions/concepts to data. | Comprehension of research context |

|   |  |
|---|--|
| Causality needs to be explained                     | Assemblage of qualitative information            |
| Resultant is quantitative information               | Adaptable and shifts as research progresses      |
| Controls to confirm authenticity of data.           | Researcher not independent from research process |
| Concept operationalization for clarity              | Generalization not an objective                  |
| Structured approach                                 |  |
| Researcher independent of phenomenon under research | Researcher part of the phenomenon under study    |

Table 4: Two main research approaches and corresponding attributes [24]

| Research Approach   | Deduction   | Induction   |
|---------------------|---|---|
| Approach to inquiry | Extremely organized   | Adaptable   |
| Idea                | Rationalist   | Idealist  |
| Sequence of inquiry | 1. Concepts<br>2. Propositions<br>3. Examination<br>4. Validation | 1. Examination<br>2. Insights<br>3. Propositions<br>4. Concepts |
| Purpose Data        | Descriptive; Description of causal connections between variables  | Probing; Gaining insights on phenomenon under study             |
| Data Collected      | Quantitative  | Qualitative   |
| Generalization      | Necessity to generalize conclusions                               | No requirement to generalize conclusions                        |

In [18], the authors advocate that a theory is an systematized form of concepts and principles envisioned to elucidate a specific phenomenon, and both deductive (positivist paradigm) and inductive (Interpretivist paradigm) approaches to theory testing and theory building respectively are similarly significant in engendering theoretical knowledge. They can together exist side by side [14], this view is supported by [24] who maintain that ontology cannot be detached from epistemology and reckons that “to talk of the construction of meaning is to talk about the construction of meaningful reality”, these two collectively inter-relate.

This research adopted the inductive logic (theory building) approach, this research seeks to grasp critical barriers and drivers that influence the digital transformation and technology adoption in the postal service in the Region of Southern Africa through analysis of secondary data from academic literature and industry reports.

3.3. Data collection methods and instruments

In [12] the authors argue that the goal of qualitative research is to resolutely choose participants or sites (or documents or visual material) that allows the scholars to grasp the problem at hand and to pose the appropriate research question that the study should seek to answer.

The data was gathered from secondary data from academic literature and industry reports, this data fixated on a array of aspects (drivers and barriers) widespread in adoption of technology and digital transformation in organizations broadly, but as well as in the postal industry. This exploratory aspect of the research was aimed at finding a resolution to the question “what are the technology and digital transformation adoption dynamics in organizations broadly and in the postal industry globally and in Southern Africa in particular?”

The research adopted the expanded Lehmann’s grounded theory research model method as proposed by [15] and as depicted in Figure 2. The study was further guided by the methodological steps depicted in Figure 3 to sift through data collected in the literature review to develop core categories. The grounded theory research originates by “entering” the field by posing a broad research question to guarantee divergent assemblage of data with no preceding ideas and paradigms in the broad sphere of technology and digital transformation adoption.

In [15] the authors advance that the initial phase of “entering the field” in GT research is meant to grasp and utilize continual contrasting. [8] endorses this view and propose that it is only through laborious evaluations (constant comparison) could a robust theory with one or more important classifications emerge as illustrated in Figure 6.

In [26] the authors argue that persistent contrasting method between proceedings (events) and settings (contexts) is the foundational power of grounded theory because through the four stages of the continual contrasting method which could best be articulated as (1) “Associating incidents applicable to each category”, (2) “Synthesizing categories and their properties”, (3) “Delineating the theory”, and (4) “Writing the theory”; the scholar relentlessly develop categories through the process of information assemblage, scrutinises and codes the data, and buttresses concept production through the process of theoretic sampling. [8] reinforces this view and emphasises that theoretical sampling is used to choose what to examine and it essentially concentrates on data collection.

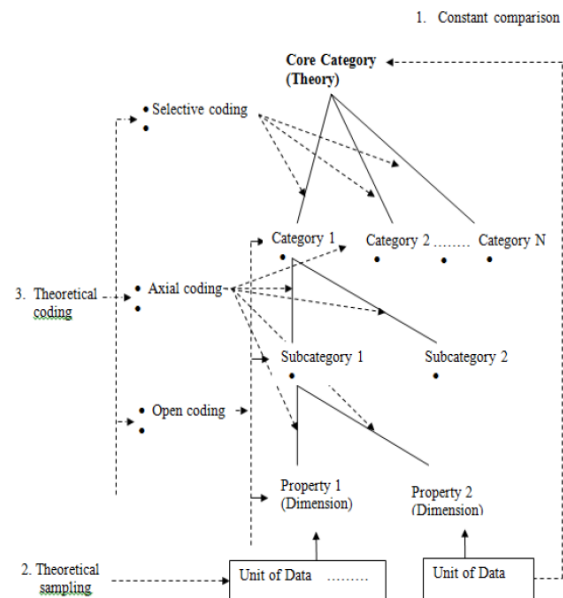


Figure 6: Grounded Theory method [8]

Figure 6 illustrates this phenomenon of the relations amongst the constant comparison method, theoretic sampling, and the theoretically sensitive coding which are the essence of GT research method.

#### **4. Discussion and findings**

##### *4.1. Data analysis, coding, and results*

Grounded Theory (GT) was adopted as a tool of analysis for the exploratory phase for this research because of its rigor in developing substantive theory.

In [27], the authors proposes that the three traits of grounded theory which are inductive, contextual, and operational fit with the interpretative nature of qualitative research. The process of analysis in grounded theory comprise of theoretical sampling, theoretical coding (comprising of open, axial, and selective); memo writing and theoretical coding [27]; while theoretical coding involves open coding, axial coding and theoretically sensitive coding [28]. Author in [15] suggests that theoretical saturation arises when additional sampling generates no further considerable value to the study and the theory becomes compressed (dense) with concepts, augmented by existing literature, and could then be deemed to be substantive theory. The endeavours involved in grounded theory methodology with regard to techniques and procedures of handling data are briefly explained below.

##### *4.2. Theoretical sampling*

In [29], the authors suggest that theoretical sampling is a vital principle of classic grounded theory, and is key to the progression and augmentation of a theory that is 'firmly grounded' in data, this view is supported by [30] who contend that "Theoretical sampling is a hallmark of grounded theory methodology". Theoretical sampling indicates additional data collection directed by the outcomes from previous data analysis. It seeks to assemble methodically additional data to explore emergent patterns. Significantly, at this stage, new data is used to validate, add to or query the emerging patterns as well as acknowledge gaps in the data analysis necessitating additional assessment or exploration [31].

In [32], the authors argue that theoretical sampling grows out of the process of breakthrough, reinforcing the approach which necessitates the scholar to take part in inductive as well as deductive reasoning. Inductive reasoning means shifting from examining occurrences or incidents, to forming a general abstract depiction with allusion to the specific attributes observed. Theoretical sampling can be viewed as a data triangulation method, it is utilized to create additional data to validate or rebut original categories until theoretical saturation is achieved [8], it serves as a thread that connects all dimensions of the grounded theory research process.

##### *4.3. Theoretical memos*

In [15], the author proposes that the composing theoretical memos commence instantaneously with open coding due to memos representing "the theorizing write-up of concepts about codes and their relations as they form in the mind of the investigator while coding". This view is captured by [9] who argue that memos evolve in complexity, compactness and exactness

during the unrelenting process of data collection to theorising, thereby boosting the theoretical fullness through ongoing process of comparison and conceptualization. Theoretical memos are an indispensable element to grounded theory research and it is incessantly performed during the data collection and analytical processes that embody the grounded theory research [8].

In [15], the authors argues that as richness and quality of codes and memos accrues, connections between them are perceived giving rise to a process called theoretical coding that gives rise to emergence of patterns and the start of sensitive coding. The goal of sensitive coding is to assimilate the diverse classifications established, expounded, and jointly related during axial coding into one robust theory [33]. Developing the emerging theory entails blending the classified memos and emerging theoretical outlines into a robust and comprehensible working theory.

##### *4.4. Theoretically sensitive coding*

Coding is an almost universal process in qualitative research; it is a fundamental characteristic of the analytical process and the ways in which scholars break down their data to create something new [34]. The author of [34] further proposes that coding is a way of indexing or mapping data, to provide an overview of distinct data that permits the scholar to grasp the data in relation to the research question posed.

In [27], the authors proposes that open coding is the investigative process upon which notions are recognized and their characteristics and aspects are unearthed in the data. Axial coding on the other hand includes synthesizing data (splintered through open coding) in new-found data by forming interactions between categories and their subcategories; Axial codes normally denote categories that describe the open codes [27] and [9] points that axial coding is required to probe the relationships between conceptions and classifications that have been developed in the open coding process which according to [15] entails exploring data to unearth a set of classifications and their attributes. [8] proposes that axial coding is a set of techniques to establish causality among categories and subcategories by synthesizing information and crystalizing it in a new way following open coding process.

In [27], the authors advance that selective coding is aimed at integrating and enhancing the groupings into a notions, which accounts for the event being explored and reinforces the statements of relations among concepts and fills in any categories in need of additional enhancement. In this analysis data analysis immediately trailed data collection. Constant comparison process is (data assemblage and data evaluation) achieved when no further information that is significant is unearthed suggesting that theoretical saturation has been attained.

##### *4.5. Discussions*

Emerging categories evolved from the grounded theory process that was articulated earlier in this study. A wide range of source documents were reviewed which explored topics such as Innovation Diffusion Theory (IDT), Theory of Reasonable Action (TRA), Technology Acceptance Model (TAM), Technology Acceptance Model 2 (TAM2), Unified Theory of Acceptance and Use of Technology (UTAUT), ADOPT Framework all led to an emerging dimension that could better be described as Individual Drivers.

The second emerging category that could better be described as Organizational Drivers, emerged from review of factors associated with Benefits, Organization and Technology (BOE), Technology, Organization and Environment (TOE), Innovation Capability Model (ICM), Digital Framework, Digital Capability Framework, and Driving process of Industry 4.0.

The third emerging category that can be condensed as Organizational Barriers emerged from literature relating to barriers of Industry 4.0 and technical barriers to Information & Communications Technologies (ICT). The fourth emerging category was Technological Drivers which emerged from review of literature with topics relating to digital maturity framework, industry 4.0 design principles and technology organization environment (TOE) model. This fourth category is balanced by a fifth category that emerged which is an inverse of the fourth category which could be summated as Technological Barriers which emerged from review of articles relating to barriers of Industry 4.0 and technical ICT barriers.

Other categories that emerged was the sixth category which was Environmental Factors (Internal) that emerged from review of literature relating to drivers to digital embracing in the postal industry, the seventh category that emerged was Environmental Factors (External) that emerged from review of literature relating to barriers to digital embracing in the postal industry. The seven dimensions are depicted in Table 5.

Table 5: Emerging categories and concepts/constructs/variables [Authors elaboration]

| Emergent Categories    | Variables and codes  |
|------------------------|--|
| Individual drivers     | Relative advantage (A), Compatibility (B), Complexity (C), Trialibility (D).   |
|                        | Attitude towards the behaviour (E), Subjective Norms (F), Intention towards behaviour (G)  |
|                        | Perceived Usefulness (H), Perceived Ease of Use (I), Attitude Towards Uses (J), Behavioural Intention (K), Actual System Use (L)   |
|                        | Subjective Norms (M), Voluntariness (N), Image (O), Output Quality (P), Job Relevance (Q), Results Demonstrability (R), Perceived Usefulness (H), Perceived Ease of Use (I), Intention to Use (S), Usage Behaviour (T) |
|                        | Expectancy performance (U), Effort Expectancy (V) Social influence (W), Facilitating Conditions (X), Gender (Y), Age (Z), Experience (AA), Voluntariness of Use (AB), Intention to Use (AC), Use Behaviour (T)         |
|                        | Innovation characteristics (AD), Population characteristics (AE), The actual relative advantage of using the innovation (AF), Learning of the actual relative advantage (AG)   |
| Organizational drivers | Professed Benefits (AH), Organizational readiness (AI), Regulations (AK), Competition (AL)   |
|                        | Industry attributes & market composition (AM), Technology infrastructure (AN), Government regulation (AK), Official and unofficial structures (AO), Communication processes (AP), Organizational magnitude (AQ)        |
|                        | Optimize the competence base (AS), Business intelligence (AT), Inventiveness and idea  |

|                                  |   |
|----------------------------------|---|
|                                  | management (AU), Organizational structures (AO) and systems (AV), Culture and climate (AW), Management of technology (AX), Innovation new stream (AY), Innovation mainstream (AZ), Innovation capability (BA), Innovation performance (BB),   |
|                                  | Strategies (AR), Customer relationships (BE), Business models (BF), Corporate structures (AO), and inter-organizational processes (BG) Customer & product knowledge (BH), Defined responsibilities (BI), Collaborative organization with flat hierarchy (BK), Empowering leadership (BL)  |
|                                  | Marketplace competition (AL), Market trends (AL), Competition pressure (AL), Business innovation model (BM)   |
|                                  | Value creation (BN), Business Processes (BO), Training (BP), Change Management (BQ), Culture-Leadership-Values (AW), Innovation Capability (AU-AY-AZ-BB), Transformation Capability (BR), Customer Centricity (BS), Operational Excellence (BT)   |
|                                  | Reduce mistakes (BU), Improve lead times (BV), Improve competence (BW), Improve operational efficiencies) (BX)  |
|                                  | Vertical integration (ET), Horizontal integration (EU), Innovation push (BB)  |
|                                  | Deviant logic (FB), Discovery (FC), Development (FD), Diffusion (FE), Impact (FD), Adoption (FE)  |
|                                  | Digital maturity (FF), Digital readiness (FG), 2IPD (FH), Firm performance (BC)   |
| Emergent categories              | Variables (concepts) and codes  |
| Organizational barriers          | Weak organizational structure and process (AO), Contradictory interests (BY), Employee and middle management resistance (BZ), Lack of upfront planning(CA), Lack of vision and strategy (AR), Poor digital savvy culture and vision (BJ), Organizational readiness (Inhibitors) (AJ)  |
| Technological drivers            | Technology Availability (CB), Technology Characteristics (CC), IT excellence (CJ), Interoperability (CD), Virtualization (CE), Decentralization (CF), Real-time capability (CG), Service Orientation (CH), Modularity (CI)  |
| Technological barriers           | Poor communications protocols (CK), Poor system integration (CL), Poor supply chain integration (CM), Lack of standards ((CN), Lack of common vision (CP), data security weaknesses (CQ), Storage capacity (CR)   |
| Environmental factors (Internal) | Staff (CZ), Financial capacity (DA) Process improvement (ER), Workplace improvement (ES), Cost reduction (EW) Employee support (EZ) Digital innovation (FA) Management support (EV), Customer demands (EX), Resource constraints (DE), Poor transition towards digital culture (DF), Limitations of IT infrastructure (DG) Lack of sufficient internal expertise required to develop e-services (DH), Custom clearance (DI), Meagre digital culture (DJ), Corruption (DL), Unnecessary red tape (DN), Micromanaging (DT), Lack of cultural knowledge (DU), Resistance to change (DV), Fear of technology (DW), Lack of relevant local content (DX), Lack of maintenance culture (DY), Lack of language skills (DZ), Low income (EA), Lack of investment (EB), Low |



|                                  |  |
|----------------------------------|--|
|                                  | return on investment (EC), High initial costs (ED), High risk on investments (EE)  |
| Environmental factors (External) | Legal and regulatory framework (AK) Public trust (DC), National policy alignment (DD), Political commitment (DB) Network (Spectrum) (CY), Supply chain transformation (EY) Market pressure (AL), Laws & regulatory framework (AK) Slow customer adoption of digital services (DK) Corruption (DL), Lack of political will (DM), High taxes (DO) Lack of regional initiatives (DP), Political instability (DQ), Lack of proper planning or coordination (CA), Monopoly (DR), Invisible hand (DS), Perceived lack of privacy (EF), Insecurity (EG), Lack of proper legal framework (AK), Poor regulation (AK)<br>Lack of software and hardware (EH), Inadequate of electricity supply (EI), Lack of internet exchange points (EJ), Scarcity of technical personnel (DH), High illiteracy rates (EK), Lack of ICT skills (DH), Lack of Research & Development outputs (EL), Increasing labor shortages (EM), Reducing monotonous tasks (EN), Work force realignment (EO), Lack of 21 <sup>st</sup> century skills (EP), Lengthier learning times (EQ) |

4.6. Critical Findings

The seven categories that emerged were further synthesized into ten emerging themes which are (a) Adoption (b) Shared vision (c) Diverging interests (d) Digital competitiveness (e) Customer insights (f) Digital ecosystem (g) Digital capabilities (h) Digital investment (i) Operational efficiency, and (j) Digital culture. These ten emerging themes are depicted in Table 6.

Table 6: Emerging final themes and associated categories [Authors elaboration]

| Emergent Themes                               | Coded variables (concepts)  |
|---|---|
| Adoption                                      | A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, S, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG.           |
| Shared Vision                                 | AR, BI, BK, AH, AO, AP, BF, AO, BL, BQ, BR, CA, AR, CK, CN, EZ, EV, DH, DX, DC, DD, DB.                             |
| Diverging Interests                           | BY, BZ, CM, CP, DL, DN, DT, DV, DQ, DS.   |
| Digital Competitiveness                       | AT, BN, BO, FD, FH, BC, CG, FA.   |
| Customer Insights                             | BE, BH, BS, EX.   |
| Digital Ecosystem (UPU standards and systems) | AM, AI, AL, AK, DK, DP, DR.   |
| Digital Capabilities                          | AN, BA, BM, AU, AY, AZ, BB, ET, BB, FE, FF, CB, CC, CJ, CD, CE, CF, CG, CQ, DG, DI, CY, EF, EG, EH, EJ, DH, EL, EN. |
| Digital Investment                            | AI, DA, DE, EA, EB, EC, ED, EE, DK, EM.   |
| Operational efficiency                        | AX, AY, AZ. AQ, AS, BG, BP, BT, BU, BV, BW, BX. CG, CL, CQ, CZ, ER, ES, EW, CA, EH, DH, EO, EP,                     |
| Digital Culture                               | AW, FD, FB, FC, FE, FG, BJ, AJ, DF, DJ, DU, DW, DY, DZ, EQ.   |

4.7. Conceptual framework

Theory is a vast notion that arranges many other notions with a high intensity of descriptive (explanatory) power. Theory of method offers direction to make sense of what methods will essentially assist in responding to the research questions posed in a particular study [35]. Theories prudently define the exact descriptions in a specific realm to clarify why and how the relations are rationally tied so that the theory provides predictions. Consequently, the exactness of good theory triggers a theory to be very accurate for all the vital elements of a theory [36].

A theoretical framework is an edifice that abridges notions and theories developed from earlier verified and available knowledge synthesized to develop a theoretical background, or source of data evaluation and interpretation of the meaning contained in the research data [37]; it therefore infers that a theoretical framework aids as the basis upon which a research is constructed [38]. A theoretical framework denotes to the theory that is adopted by the researcher to guide the research path; as a result a theoretical framework can be defined is implementation of a particular theory, or established concepts drawn from related theory, to provide a elucidation of an event, or provide in-depth insight on a specific spectacle (phenomenon) or research problem that requires resolution [39].

An abstract (conceptual) framework on the other hand is an edifice which the researcher considers to best enlighten the organic advancement of the phenomenon under study [37]. On the other hand, a researcher may believe the complexity of the research problem under study cannot eloquently be explored with focus on only one concept, or concepts engrained within a single (integrated) robust theory; and this triggers the researcher to “synthesize” the current views expressed in literature in the form of theoretical and from empirical findings relating to area under study. The fusion (synthesis) could best be described as a conceptual framework, which in essence embodies an ‘integrated’ vision of the problem under study [39].

A conceptual rather than theoretical framework approach was adopted as the grounded theory approach presented in 2.1 and the elucidation presented in 4.5 encompasses multiple dimensional theories and concepts as presented in Table 5, which are synthesized to develop final themes as presented in Table 6.

The proposed conceptual framework presented in Figure 7 denotes illumination of the insights and subsequent synthesis of the grounded theory research which was elaborated upon in previous sections of this paper. The Universal Postal Union (UPU) endeavours to create a digital ecosystem through its business processes, standards, and systems which the postal sector transacts in, the digital ecosystem facilitates a shared vision which is depended on customer insights which leverage the shared vision and improves the digital ecosystem.

Adoption of the systems, standards, and protocols of the UPU entrenches a deep and robust digital culture. A robust digital culture on the other hand enhances the digital ecosystem and enables a shared vision. A clear and unambiguous shared vision amongst stakeholders drives operational efficiencies and triggers digital investment. Digital investment develops digital capabilities and on the other hand operational excellence enhances digital

capabilities. Digital capabilities ensure digital competitiveness which incorporates factors such as digital innovation and digital disruption.

Diverging interests which denotes barriers ranging from institutional to organizational inhibits or rather curtails a shared vision and ultimately negatively affects the path towards digital competitiveness. Customer insights, digital ecosystem and digital culture are inputs to a shared vision which ensures the development of digital capability through operational excellence and digital investment which results in digital competitiveness. It is crucial to mitigate diverging interests in order to achieve digital competitiveness which guarantees sustainability of the postal sector.

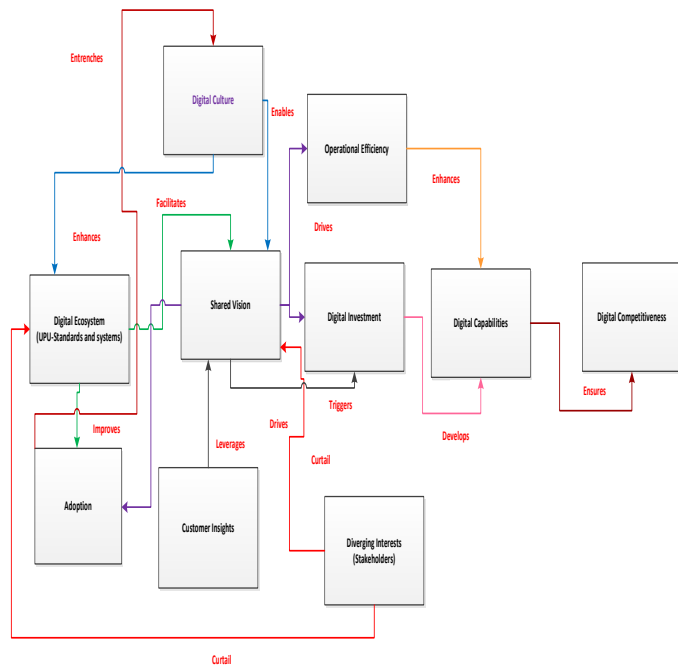


Figure 7: Conceptual framework [Authors elaboration]

#### 4.8. Conclusion and future research

The world is faced with sweeping revolutionary changes ushered by the digital age, which is altering the world as we know it. The postal industry is not operating as an island and therefore not detached from this new phenomenon of the digital age which is blowing strong winds of change whose strong currents are disrupting all sectors of society on a global scale. Business models are being disturbed across all industries including the postal service.

The phenomenon of digital transformation was introduced, followed by an in-depth review of literature on Grounded Theory (GT). The GT process was presented as well as the research methodology adopted in this study which articulated the “research onion” which delved into research philosophy, research approaches and the research design which comprised of research strategy, research choice, time horizons, and data collection & analysis techniques and procedures.

The data analysis coding and results were presented in which theoretical sampling, theoretical memos, and theoretically sensitive coding were highlighted. The initial thirteen emerging categories were presented and discussed. The 13 initial emerging categories were further synthesized upon which nine key themes emerged which were presented. A conceptual framework that elucidates the nine themes was presented and explained.

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The gap acknowledged in this study is the difficulty of traditional logico-deductive approaches to explore phenomenon characterized by newness and extreme dynamism such as disruptive technology, digital transformation which is buttressed by a diversity of enablers and inhibitors that range from technical barriers and drivers to soft issues such as digital culture for instance. It is said that culture can eat strategy for lunch, which means that should the culture of an organization not be matured and developed; no amount of strategizing and deployment of technologies will see the light of the day.

As a recommendation towards future research, the ten emerging themes and their associated categories and constructs of the categories will be utilized in the development of a unified conceptual framework through application of System Dynamics as a modelling tool. Anylogic software will be used as the preferred modelling software to model the dynamics associated with digital transformation and technology adoption of the postal sector in Southern Africa. It is envisaged that modelling the nine emerging themes in a dynamic setting will provide insights and patterns that emerge from causality and feedbacks as factors (barriers and drivers) interact.

**Conflict of Interest**

The authors declare no conflict of interest.

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