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Capitalizing on data-driven decision-making culture for tourism management

A case study of Tanzania national parks

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Capitalizing on data driven decision making culture for tourism management: a case study of Tanzania national parks

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ABSTRACT (MAX. 200 WORDS):

According to previous study, data-driven decisions can result in fact-based decisions that help a company flourish. National parks, particularly in developing countries, are not properly utilizing data as a decision-making tool, which is essential for enhanced competitiveness. Empirical results show that the park administration makes most of its decisions based on established rules when implementing plans, addressing most reported obstacles, and not using a data-driven management method. Currently, these businesses' decision-making is based on gut instinct, which is carried out by their executives and senior managers, rather than the benefits connected with the use of data. Furthermore, there is a dearth of procedure on how tourist management in these countries may transition from existing decision-making processes that is decisions based on gut sentiments, to data-driven fact-based decisions. To close this gap, the goal of this paper is to propose a framework for attaining data-driven decision-making culture in tourist operations, using Tanzania as a case study, in the context of several aspects such as leadership capability, digital capability, organization, and data use culture. The goal is achieved through a qualitative-based case study method conducted at Ngorongoro national park. Further study is required to test the effectiveness of DDDM culture in tourism management at the national park and its impact on visitors' satisfaction.

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1 Introduction

Technology, as a central enabler of the fourth industrial revolution (I4.0), has a huge impact on tourism, as it has on all disciplines, economies, and industries (Korže, 2019). Under the tag line "data is the new oil," "as Clive Humby, co-founder of Dunnhumby Customer Data Research, explained in 2006" (Engel & Ebel, 2019, p.1), the focus in the I4.0 era is turning towards data, which is considered one of its important foundations (Miragliotta et al., 2018). The implementation of state-of-the-art Industry 4.0 technologies is recognized by its disruptive effects in several industries, particularly tourism Manjari (2018 cited in Korže, 2019). Pencarelli (2020) argues that tourism ecosystems and territories in the near future will have to embrace smart tourism perspectives and also aim to enhance tourism experiences and increase competitive advantage of smart tourism destinations.

Tourism has grown steadily over the last six decades, becoming one of the world's biggest and fastest-growing industries; by 2030, global tourists' arrivals are projected to exceed 1.8 billion (UNWTO, 2017). In Tanzania the number of international arrivals has increased from 500,000 in 2000 to 1,505,702 in 2018 adding to more than \$2.4 billion USD in foreign currency (Tanzania Invest, 2021). On the contrary, during COVID-19 pandemic, according to UNWTO (2020a), travel and tourism is projected to be the hardest hit sector, affecting both demand and supply. Furthermore, UNWTO (2020b) affirms that the effect of this unprecedented pandemic crises on the travel and tourism sector is fast changing the industry. Many of tourism service providers, regardless of their type, size, or scope of activity, have experienced significant losses, estimated to be in the billions of dollars (Goodwin, 2020; Nicolas, 2020). Having been impacted heavily by the covid pandemic, the tourism industry in Tanzania specifically in tourist destinations such as national parks, is trying to regain its position by embracing and harnessing the power of the digital technologies which keeps generating data and more data.

Over time, leading organizations have transitioned from passive data collection to active data collection using consumer experience to help develop and test new services (Brynjolfsson, Hitt & Kim, 2011) as it is beneficial to apply technology (Wayman, 2005) in data collection and processing which have been useful to businesses and organizations at the operational level (Stobierski, 2019). Therefore, data-driven decision making (DDDM) as a method of making decision based on data or statistics rather than solely on subjective judgement (Brynjolfsson, Hitt & Kim, 2011) or gut feelings (Jain, 2013) will allow for validation of the further actions (Stobierski, 2019).

Furthermore, data-driven decision making will result in fact-based decisions (Müller, Fay & Vom Brocke, 2018), as data can potentially aid in instruction and administrative process of decision taking (Mandinach, 2012). As a result, data-driven decision making is expected to play a significant role in improved future development of tourism management towards smart tourism.

1.1 Problem

Several aspects, including the market priorities and the forms and consistency of data you have access to, will determine how data will be integrated into the decision-making process (Stobierski, 2019). Today, organizations are collecting huge amount of data (Müller, Fay & Vom Brocke, 2018) however, large proportion are poor data (Wieringa et al., 2021) only a small portion of the data gathered is used to make decisions, resulting in the lack of flexibility to use and handle larger data volumes in order to make better decisions (Dallemule & Davenport, 2017).

Brynjolfsson, Hitt and Kim (2011) study claims that managerial choices are increasingly relying on data-driven analytics rather than an executive's gut feeling in a growing number of businesses, however, in contrast Provost and Fawcett (2013) argues that lots of decisions are often taken based on domain experts' intuition. This experts' intuition methodology may portend bias due to lack of a systematic perspective that is evidently based (Wong & Wang, 2003). Therefore, rather than relying on the gut intuitive strategy, data driven decision making is a technique that exploit data to make strategic decisions (MacDonald, 2021). Further, for the effective use of data it is vitally important to have an organization's culture that will support data collection process and its exploration (AltexSoft, 2017).

Despite the amount of research on data driven decision making culture of businesses and organizations, it is limited in its scope. Even though the obstacles to building a data-driven organization have been studied numerous times (Berndtsson, Lennerholt, Svahn, & Larsson, 2020), yet the acumen on how organization can make the shift from a current decision-making method to an advantageous data-driven decision-making culture is yet to be adequately explored (Sharma, Mithas, & Kankanhalli, 2014). Rather, few scholars have only been identified for their effort in finding those factors contributing to adoption of technology (Khosla & Kaur, 2018) used for data driven practice (Halper & Stodder, 2017) and its implication at business level (Stobierski, 2019). However, the authors have observed that not enough studies had been conducted on the *process of transition* in terms of the constrain to adoption of this practice, leading to why organizations are battling to bridge the difference between the value that data provides and the value that their current systems capture (Vasal, Vohra, Payan, & Seedat, 2019) since they lack insight on how to transition from existing practices to effective practice (Sharma, Mithas, & Kankanhalli, 2014). As a result, more emphasis should be placed on what issues can be solved with emerging technology (Patel, Shangkuan, & Thomas, 2017) more importantly, in area of data driven decision making culture (Mandinach, 2012). Therefore, it is crucial to explore this area of concern as this challenge demands a complete overhaul on the approach to strategy deployment (Vasal et al., 2019) that addresses relevant factors influencing decision making and human gut feeling that will lean towards turning data into operational value (Kahneman, 2003).

1.2 Purpose

In the current impacts of industry 4.0 and the shift from traditional tourism management to smart tourism, e-tourism, and tourism 4.0, data driven decision making culture is seen as a strategy towards value proposition and gaining competitive advantage for most of the organizations national parks included. Hence, the purpose of this qualitative case study is to understand the current state of data driven decision making for tourism managers at Tanzania national parks and propose a framework for achieving the data driven decision making culture. To fulfil this purpose, this study will strive to answer the following research question: -

"How can Tanzanian National Parks build a data driven decision making (DDDM) culture for tourism management"

1.3 Delimitation

Tourism industry involves a number of key stakeholders including but not limited to wildlife conservation, National parks, tour operators, and Hotels. This study has several delimitations, the most significant is the number of participants. To begin with, the study is delimited to National parks as one of the major tourism destinations that data driven decision making culture has a direct impact. Secondly, the study

will focus on tourism management, with the tourism managers, officers and park wardens as key informants in the study. Moreover, confidentiality and anonymity are two other essential viewpoints and science qualities in methodology selection; as a result, this study would prevent any kind of inference in the data and findings obtained by the interview or other data collection method performed. Lastly, based on the results of the assessment levels, the data driven decision making framework will be proposed.

2 Literature Review

Theoretical Background

A comprehensive literature review on the topic, as well as a background analysis on the current data driven decision making (DDDM) culture of national parks, were needed to gain a thorough understanding of data driven decision making. When it comes to data, data driven, decision making, and data driven decision making, there are a lot of terms with vague definitions, so discussing DDDM in a wider sense and defining its related terms is essential. After defining DDDM and related terms sufficiently, a conceptual model is adopted to help the empirical analysis and to address the research questions raised by this study. The theoretical issue around data quality is considered beyond the scope of this study and therefore no inference is drawn on data quality at the data level in the conceptual framework discussed in this literature review.

2.1 Data Driven

Data plays a crucial role in shaping an enterprise into a data-driven organization, since it is impractical to become data-driven without a solid data foundation. As Jims Barksdale states - "If we have data, let's look at data. If all we have are opinions, let's go with mine"¹. Becoming Data-driven entails developing techniques, skills, and, most importantly, a data-driven culture where basic foundation is on data collection and access (Anderson, 2015). From other points of view, data is gradually being seen as a mystical, subjective resource that experienced professionals use to help them in smarter decisions making (Treder, 2019). This means that in order for companies to become data-driven, they must place data at the center of their decision-making processes, which would give them a strategic advantage.

Treder (2019) contends that taking a data-driven action takes some planning and is not accidental; rather, it should be deliberately driven with the goal in mind, and that no enterprise is too small for a data-driven approach. The basic foundations proposed by Anderson helps further in determining the point at which an organization is considered a data driven. Organizations must be collecting data and the data collected must be accessible which may not necessarily be sufficient without the ability of that data to be joined, shared and queried (Anderson, 2015).

2.2 Decision Making

Taylor and Purchase (2016) defines a decision as "a determination that businesses make on a regular basis, a selection or calculation of an outcome that depends on a number of prevailing circumstances (inputs) and which, ultimately, has an observable impact on the behavior of the organization" (p.10). Based on this definition, decision making can be described as the process of selecting possible alternatives that depends on inputs (data) which will have an impact on the organization. Provost and Fawcett (2013) presents two types of decisions which are "...*decisions for which "discoveries" need to be made within data, and decisions that repeat, especially at massive scale...*" (p.54), which are later referred to in this study as strategic decisions and operational decisions. Described by Paradice and Dejoie (1991), decision making is the outcome of intellectual processes that result in the selection of a course of action among various alternatives, leading to a final selection.

¹ <https://www.goodreads.com/quotes/655987-if-we-have-data-let-s-look-at-data-if-all>

Decision making is central to senior management and managers and plays an important role in formulating and executing strategic objectives which enhances business productivity and reduces uncertainties on the basis of data (both internal and external) (Kiradoo, 2011). In the past decisions were made based on opinions and experience due to the fact that, data as an input to decision making process, its compilation was weak or not in a manner that could be conveniently used for deriving perspectives in the 1980s (Kumar, 2017). Owing to the magnitude of the challenges that organizations face and the insufficient time required for decision making, the human experience lacks the capacity to make the right decisions Simon (1972 cited in Kumar, 2017). Despite the fact that most organizations data collection have traditionally been costly and time-consuming, organizations faced difficulties in decision making due to lack of sufficient and availability of data. Notwithstanding that, the practice currently is different in a way that organizations are confronted with large volumes of data (Müller, Fay & vom Brocke, 2018) and surprisingly less of these volumes of data are used for decision making (Cai & Zhu, 2015). It is important to remember that decision making is a constant process in most organizations, and the more data-driven it is, the more successful it is. Taylor and Purchase (2016) argues that as managers make decisions continually and their decisions quality highly depends on data to have a significant impact on the organization.

2.3 Data Driven Decision Making (DDDM)

Data-driven decision making (DDDM) has varied meanings according to different authors. For instance according to Mandinach (2012) data driven decision making (DDDM) refers to the “...*systematic collection, analysis, examination and interpretation of data to inform practice and policy...*” (p.1) and it has also been referred to as “.. the practice of basing decisions on the analysis of data rather than purely on intuitions” by Provost and Fawcett (2013, p.53). Generally, DDDM is the situation when an organization draws insights on processed data for decision making. These decisions could be operational – daily operational activities and strategic – drawn from organizational strategies. In the current technological era where data is central to organizational performance and competitive advantage, “[i]t is no longer acceptable to simply use anecdotes, gut feelings, or opinions as the basis for decisions” (Mandinach, 2012, p.1). In their study, Provost and Fawcett (2013) presents statistically how more data-driven firms are more productive (with the standard deviation of DDM scale of 4-5% increase in productivity). This means that DDDM has the potential to transform an organization if well planned.

The continuous growth in DDDM literature gave rise to emergence of applicable several theoretical frameworks (Ikemoto & Marsh 2007; Abbott, 2008; Mandinach, Honey, Light, & Brunner, 2008). These frameworks are seen to have comparative components such as a cyclical data-processing cycle and the processes are usually represented at a macro level, with different but related components in each (Mandinach, 2012). This study explored the framework present by Mandinach, Honey, Light, and Brunner (2008). Although, it is a theoretical model focused on practitioner experiments and a semantic study of those findings, however, it has the benefit of delving further into and detailing the thinking abilities that are hypothesized to be associated with DDDM (Mandinach, 2012). As presented by the Here scholars (also, see figure X), the framework is built on a cycle in which data is converted into information and then finally to knowledge (Mandinach, 2012).

2.4 Data Driven Decision Making (DDDM) Framework

The continuous growth in DDDM literature gave rise to emergence of several applicable theoretical frameworks (Ikemoto & Marsh 2007; Abbott, 2008; Mandinach, Honey, Light, & Brunner, 2008). These frameworks are seen to have comparative components such as a cyclical data-processing cycle and the

processes are usually represented at a macro level, with different but related components in each (Mandinach, 2012). This study explored the framework presented by Mandinach, Honey, Light, and Brunner (2008) and adopted it as the basic foundation for building up the DDDM culture and will be used to analyze the existing decision-making practices in the studied case. Although, it is a theoretical model focused on practitioner experiments and a semantic study of those findings, it has the benefit of delving further into and detailing the thinking abilities that are hypothesized to be associated with DDDM (Mandinach, 2012). As presented by the scholars (also, see figure 1), the framework is built on a cycle in which data is converted into information and then finally to knowledge and it also uses six cognitive skills that are crucial in decision making process (collect and organize, analyze and summarize, and synthesize and prioritize) (Mandinach, 2012).

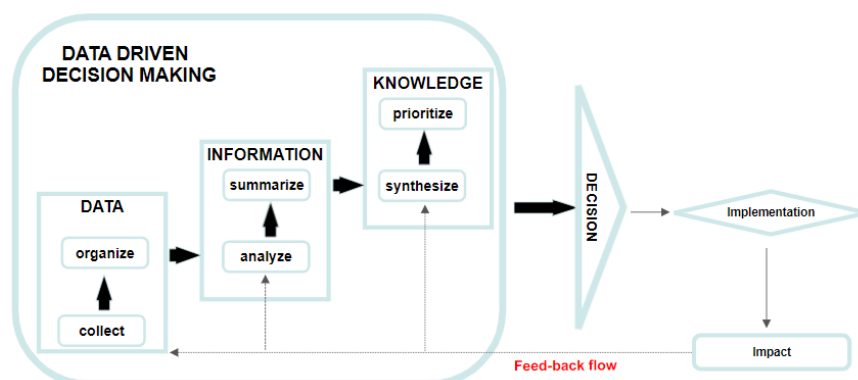


Figure 1: Data-Drive Decision Making (DDDM) conceptual framework (Mandinach, 2012)

2.4.1 Data level

Data level is where users *collect* and *organize* data (Mandinach, 2012), process and store the data in order to facilitate decision-making (Schuh, Anderl, Gausemeier, Hompel, & Wahlster, 2017). Using the right data is a basic condition for extracting value from data (Schuh, et al., 2017), in which at first, the data collection strategy should be broad and accessible, then to become more flexible as the data collection progresses (Moser & Korstjens, 2017). Although, accuracy of the data generated will have a huge impact on how much it helps in decision processes (Morbey, 2013). Generally, before qualitative analysis is conducted data organization must be performed by storing huge volumes of data in smaller, more accessible chunks that can be quickly accessed for further processes (Moser & Korstjens, 2017). In line with this thought, it is critical to clearly determine what data quality (Janssen, Voort, & Wahyudi, 2017) or data is required to be stored and retrieve for making an outright decision (Barring, et al., 2018). In terms of quality Morbey (2012) described data quality as: "... the degree of fulfilment of all those requirements defined for data, which is needed for a specific purpose" (p. 4). Also, there are five dimensions of data quality which includes availability, usability, reliability, relevance, and presentation quality according to Cai and Zhu (2015) (presented in Table 1). The fact that data-driven decision making is so reliant on the data used to make a decision, hence it is easy to understand the implication of a poor-quality data on decisions and its impacts on the decision's quality (Janssen, et al., 2017).

Table 1: Data quality dimensions

Dimension	Elements
Availability	<i>Accessibility</i>
Usability	<i>Timeliness</i>
Reliability	<i>Credibility</i>
	<i>Accuracy</i>
	<i>Consistency</i>
	<i>Integrity</i>
	<i>Completeness</i>
Relevance	<i>Fitness</i>
Presentation quality	<i>Readability</i>

Subsequently, Janssen et al., (2017) emphasis that the consistency of data is determined not only by the data itself, but also by the method by which the data is collected and stored, in which such accumulated data must be organized in a manner to make sense of them (Mandinach, 2012). Furthermore, since data can potentially help in creating information and knowledge development that will aid decision making (Mandinach, 2012), thus, organization must identify technologies required for data collection and incorporate the appropriate technology to capture and analyse decision-supporting data and in the same process data management issues must also be addressed (Davenport & Harris, 2007). Understandable so that organization may lack the prerequisite technology capacity for good data collection, however, it is inevitably necessary that organizations must devote necessary resources to acquire modern technology or upgrade any existing tools or technologies as an alternative means (Mittal, Khan, Romero, & Wuest, 2018).

2.4.2 Information level

In essence, information establishes a link between incoming data and a specific user (Boisot & Canals, 2004). Therefore, users *analyze* and *summarize* information at this level, ground the data and translate it into facts and information using context (Mandinach, 2012). Summaries will assist user in focusing on specific patterns of performance that may necessitate instructional action while at this point, the raw data has been turned into assertions that identify both strengths and weaknesses through analysis and summarization (Mandinach, 2012). According to Boisot and Canals (2004) the significant regularities embedded in the data that users seek to obtain from it are referred to as information in which what constitutes a substantial regularity, on the other hand, may only be determined in terms of the receiver's particular dispositions. Further, they argued that just when what comprises a significant regularity is set up by convention, would information seen to be objective, and at that point, just within the environment managed by the convention. Finally, they sum up to say that information is an extraction from data that, by changing the applicable likelihood transference, has the potential to impact valuably on the user's knowledge base.

2.4.3 Knowledge level

At the knowledge level, after which the information is translated into intelligence, users *synthesize* and *prioritize* knowledge (Mandinach, 2012). Knowledge which is a collection of expectations held by users that is influence by the arrival of new facts (Arrow, 1984) in such that, these expectations encapsulate

the previously situated relationship between users and the environment (Boisot & Canals, 2004). Mandinach (2012) explains that the information retrieved is synthesized in such a manner that it will assist in shaping the knowledge base about the activities performance that can be used to make instructional decisions. Further, he elucidates that this information will be prioritized to determine the next line of action given that prioritizing the synthesis information will give the users the opportunity to better understand the situation and determine an applicable way of transforming the information into actionable decision implementation based on the knowledge transmitted. Therefore, the decisions that are implemented allows users to assess and examine the impact of the processes at all levels, so also is the performance assessment equally helps to determine and differentiate decision based on needs (Mandinach, 2012).

With this framework, Mandinach (2012) concludes that since DDDM is an iterative cycle rather than a linear procedure, the result will at this point decide whether the user has to go back to a previous step, such as collecting more data or to re-evaluate certain information in order to measure activity's performance and adjust necessary instructional decisions that may be required.

2.5 Data Driven Decision Making Culture (DDDMC)

Organization culture is one among the requirements of using data to make decisions effectively which must support DDDM in a way that staff or employees value and embrace data use to develop and implement strategies (Maxwell, Rotz & Garcia, 2016; Preskill & Boyle, 2008). Mandinach (2012) argued that it is impractical to base decisions on feelings, stories and experiences but rather the emphasis should strongly be on data use and manipulation to inform decision making. This is one of the transformative areas that requires attention. Based on this fact, it is observed in many organizations that the basis of decision making is sometimes based on experienced personnel who have been in the organization for some years or who have a higher level of education or working skills. Technological advancements demand shifts from just decision making to DDDM culture. Based on arguments by some scholars that as the number of Internet-enabled devices rises, capturing, saving, and reviewing massive volumes of data on consumer activity has become easier (Fischer et al., 2018; Gubbi et al., 2013), so should the decision making practice change within organizations to meet the demands of connected stakeholders and large amounts of data they generate.

The DDDM culture in the organization needs to have strong top level management support (c-suite level) to overcome some resistance at the operational levels. Having the top-level management support would imply a transformation from the vision to the strategies as Mandinach (2012) already stated that “[t]he creation of a data culture is a direct result of the vision for data use” (p.75). If the top-level management sees the need for DDDM culture, they will have data use in their vision which eventually would set the scene for DDDM practices. Treder (2019) also argues that it is extremely important to take data related concerns critically and “[t]his is where a “data-driven culture” needs to be specified more concretely: It is the culture of treating data adequately!” (p.128). drawing insights from this, creating a DDDM culture is considered as a foundational requirement prior to even implementing DDDM itself. As planning is required during setting the tone for data driven decisions so should its culture that will affect an organization's operational and strategic activities.

2.6 DDDM Culture in Tourism Management

Tourism Management as Organization

In countries, tourism is typically centralized in capital and major cities, where tourism and non-tourism businesses office are located (Britton, 1982). According to Britton (1981) some of these cities have direct access with tourist in terms of tourist attractions and destinations, allowing them to manage the tourist flow chain using technologies and marketing. Further, he explains that these cities can provide touring package in form of lodging, transportation, and excursion that in turn influenced and controlled the tourist's spending and activity. Woodside and Martin (2008) study explain that understanding tourist motives or their essence of travel motivation may aid tourism managers and marketers in sense making, service planning, administering, product marketing coordination, and tourist's attraction and retention. By describing environments and events aids in improving the consistency of sense making and increasing executives' knowledge in general (Weick, 1995). From the management perspective, the term "planning" is a somewhat vague and complex one to describe while describing Healey's definition that placed planning as "the management of public administration and policy analysis, which aims to manage the efficiency and effectiveness of public agencies" (Hall, 2008, p.9).

Management functions

As tourism management functions are complex task, this study identifies some of its vitally important objectives and goals. As presented and discussed by Woodside and Martin (2008), the five general areas in tourism management which are briefly summarised below:

- scanning and sense making

On one hand, from data perspective, collection of information in the environment is known to be a scanning process which is a constant operation for organizations (Maitlis, & Sonenshein, 2010) however, a change in the environment can place the company in the middle of new problems since scanning is both active and subjective which, therefore, necessitate the importance of administrators deciding on what germane insight they are looking for (Djaballah, Hautbois, & Desbordes, 2015). On the other hand, sense making is based on the premise that (Djaballah, Hautbois, & Desbordes, 2015) "human understanding and action are based on the interpretation of information and events by the people experiencing them" (Gioia & Chittipeddi, 1991, p.435). This emphasis that managers are unable to provide any understanding of a situation in an unknown environment as well as they become perplexed by so many explanations of the condition in an uncertain situation (Djaballah, Hautbois, & Desbordes, 2015). Thus, according to Woodside and Martin (2008) stakeholders who pay careful attention to the environment in terms of scanning and sense making, articulate unwavering core principles, and gradually acquire the skills that will help them to make a long-term contribution to their organizations in providing excellent results.

- planning.

In the tourism industry, planning is becoming more popular (Athiyaman, & Robertson, 1992). Tourism management, according to Woodside & Martin (2008) welcome the view that planning and practice are essential for achieving successful implementation and high efficiency. Further they claim that planning aids in the clarification and sense making as well as identification of feasible action direction to take. Planning-implementation practice in a low cost and impact ambience lets executives develop expertise and skills (Woodside & Martin, 2008) and lowering the likelihood of potential risk and instability (Athiyaman, & Robertson, 1992). It was established in Woodside & Martin (2008) study that examples of skill-building activities are decision making simulation and problem-solving tasks, in which accurate forecasting is needed for successful organizational and strategic planning (Athiyaman, & Robertson, 1992). Therefore, it is important to note how effective management makes a difference in incorporating

tourism's elements and footprints into a comprehensive context that demonstrates how it can be subjected to an overall planning and management mechanism (Woodside & Martin, 2008).

- implementing

Yüksel & Yüksel (2000) pointed out that tourism management and growth plans are notably challenging to implement. Further, they stated that this may be due to a lack of knowledge of the aspects of the small and large organizational context in which planning takes place, as well as the methods used in the planning and implementation process. Also, they mentioned that a lack of understanding of relationship patterns and the resource and power interdependencies among multiple departments involved in the decision-making process, can also contribute to plan failures. With this line of thought, according to Woodside & Martin (2008) grounds for implementation involves examining what occurs, what is been carried out, and what is ignored that was in the plan, as well as measures taken that were not in the plan, however, the implementation of a plan can also attract drawbacks as a result of resource misallocation, lack of accountability in decision-making, high degree of political power accumulation and unprofessional management. Another aspect of concern in implementing is that there, have been several instances where tourism plans developed at the top and introduced at the bottom have failed to provide the desired results where one of the reasons for such failure is that central government policy development and implementation are out of step with local demands and are not focused on thorough awareness of the local community (Yüksel & Yüksel, 2000).

- activity and impact assessing

Tourism, like other anthropogenic activities, can have an effect on the environment which therefore require the need to evaluate the effect of certain actions in form of impact assessment on the natural resources such as, environment, culture, and socio-economy (Biodiversity, n.d.). Woodside & Martin (2008) argues that most tourism management executives have no expertise, experience, or ability in using the available resources in the appraisal research literature, according to evidence of operation and effect assessment while tourism management performance assessments also shown that the auditors have no expertise in evaluating management performance and a lack of understanding of the literature on assessing executive decisions and results of tourism management/marketing programs. In addition, they affirm that the assessment of the tourism executive activities in terms of their actions and outcomes as well the impact evaluation is highly critical for the tourism establishment. It is therefore important that tourism management industry adopt and use a very valuable metrics to examine and measure managements' actions, decisions and performance results (Woodside & Martin, 2008).

- administering

Administering (i.e., creating vision and organizational values, exercising will, crafting mission, coaching, training, and coordinating) is key for an effective tourism management practice (Woodside & Martin, 2008) wherein Peters and Austin (1983) study examine administering concept, by emphasising that the benefits of closely measuring whether management and experts in the organization accept that administering is integral to the tourism management institution (Woodside & Martin, 2008) and its values. The values which are the guiding principles represent primary goals that apply to all facets of beliefs and behaviours (Schwartz and Bilsky, 1987) of the management which is crucial in every part of the value chain to collaborate on a shared goal in achieving system optimization (Aslam, Syberfeldt, Pehrsson, Urenda-Moris, & Moris, 2018) and future goals (Athiyaman, & Robertson, 1992). As a result, tourism management must embrace the alignment of the organization's goals and strategies which needs to be combined at various organizational levels to prevent decrease in resource management and a lack of competitiveness and alertness (Yan, Morris, & Frechette, 2016).

Tourism Management and Digitalization

Tourism is certainly one of the industries most influenced by the modern digital age (Ivanović, Milojić, & Roblek, 2016). According to The United Nations World Tourism Organization (UNWTO) tourism is defined as: “a diverse industry that serves as a key economic catalyst for socioeconomic growth in a

variety of areas and destinations across the world” (UNWTO, 2009, n.p). Teixeira, Teixeira and Eusébio, (2020) emphasis that tourism is one of the most profitable commercial practices on the planet, and it plays an important part in the economies of many countries. While Seckelmann (2002) pointed out that in less developed nations, tourism development necessitates modest investment and has a rapid and direct effect on regional economic growth.

In line with the thought on Tourism 4.0, Peceny et al. (2019) explained that Tourism 4.0 emergence has revealed the capacity for modernization of entire tourism sector. Furthermore, the study assumes that technology such as the Internet of Things, Big Data, Chained Disabilities, Artificial Intelligence, Virtual Reality, and Augmented Reality, which offer significant benefits from Industry 4.0, can be extended to the tourism sector. Hence, Ozturk, (2021) concludes that an enhanced tourism experience can be built in both the physical and digital environments by developing a shared environment including local people, local business, visitors, service providers, and government. Smart or digitalization of tourism is a phenomenon that will distinguish, expand, and incorporate Information and Communication Technology (ICT) into the tourism experience through theories and implementations (Ozturk, 2021).

Therefore, vision, predicted impacts, functional needs, and processual objectives all drive the road towards Industry 4.0 in which the interplay of these influencing elements leads to the success of an Industry 4.0 transition with an emphasis on areas such as smart solutions, smart innovations etc (Capgemini, 2018). Ozturk (2021) standpoint on digital environment as mentioned above is complemented by MuleSoft Report Connectivity Benchmark Report (2018), which states that from small to large, digitalization has impacted all businesses almost in every industry, hence it has become a force to be reckoned with. In the report, it is also stated that in order to flourish in the digital environment and gain competitive advantages over competitors then businesses must respond quickly and become more flexible with digitalization. In another word, the term "digitalization" refers to the broad phrase used to characterize the world's digital change, particularly in the economy (Coupey, 2016).

Consequently, Westerman, Bonnet, & McAfee (2014) claims that digital business innovation has established itself as one of the most important business patterns of the future, as well as a precondition for economic stability. Furthermore, they affirm that technology (in the context of digital capabilities) has generated the most important business tales and it is moving towards the notion of digitizing everything and every operation. However, more than technology is required, leadership (in the context of leadership capability) is also required to achieve a true digital operation (Westerman, Bonnet, & McAfee, 2014). To be placed in proper perspective, the notion of class of digital organization practices (Mithas, Tafti, & Mitchell, 2013), Westerman, Bonnet, & McAfee (2014) presented the digital mastery concept, which is described and categorized into four levels: Beginners, Fashionistas, Conservatives and Digital Masters, see figure 2.

- < Digital capability > +	Fashionistas A set of advanced digital features No digital vision, no coordination Digital features and digital culture in silos	Digital masters Overarching digital vision Many coordinated advanced digital features Strong digital governance Solid, integrated digital culture
	Beginners Management not really convinced on business value May carrying out some small scale initiatives Immature digital culture	Conservatives Digital vision exists however underdeveloped Dominated by traditional digital capabilities, few advanced Taking active steps to build a digital culture
	- < Leadership capability > +	

Figure 2: Digital Mastery levels by Westerman, Bonnet, & McAfee (2014)

Beginners

According to Westerman, Bonnet, & McAfee (2014) definition, beginners are organizations that have only recently begun the journey into digitalization. Their approach to digital transformation is known as a "wait and see" strategy since they always want to take additional precautions before acting. They further clarify that the definition implies that such organization frequently seek to verify that particular digital changes have been successfully executed by other firms, allowing them to go on with their own digitalization strategy. To buttress their standpoint, they articulate that certain beginner believe that the benefits of digitization are only applicable to other businesses, not their own, as a result, beginners only maintain basic digital skills, which puts them behind their competitors in the sector. Moreover, (Qumer Gill, Loumish, Riyat, & Han, 2018) and Hilali & Manouar (2019) concur that Nokia failed to address digital transformation in the same way as Android and Apple launched their digital business models, claiming that digitalization was not for them and that they were satisfied with their current business model.

Conservatives

According to Westerman, Bonnet, and McAfee (2014), conservatives have digital capabilities that are superior to those of fashionistas; nonetheless, high regulation and governance remain the primary impediment to these industries' shift to developing robust digital skills. They went on to say that these businesses are unconcerned about technological developments because they are focused on ensuring that every digital expense is painstakingly examined and rigorously handled. Furthermore, they claim that these organizations' top management is more concerned about mismanaging their resources with no less interest in committing to more financial risk.

Fashionistas

Fashionistas do not use the "wait and see" technique since they are constantly ready to acquire any new technology they may find; however, they want to show off their digital skills, but they do not alter their business process's internal operations according to Westerman, Bonnet & McAfee (2014). In other word they further pointed out that this demonstrates that fashionistas are less concerned with changing what is under the surface.

Digital Masters

The Digital Masters have faced the same hurdles as the other three groups and have triumphed in which they have effectively positioned themselves at a competitive advantage over their competitors in their respective sectors because they fully understand where and how to deploy their resources, and senior management is fully committed to solidly driving the business into the digital future (Westerman, Bonnet, & McAfee, 2014). There are several instances of firms that have disrupted their sectors through their digital skills and leadership according to Westerman, Bonnet, and McAfee (2014). And they cited examples such as Google with Android in the advertisement sector, Facebook in advertisement sales, Apple in mobile device sales, and Amazon in ecommerce, to name a few. Digital Masters are 26 percent more lucrative than their sector competitors in terms of revenue, while their physical assets bring in 9 percent more revenue (Westerman, Bonnet, & McAfee, 2014). From capacity context, Westerman, Bonnet, and McAfee (2014) hinted that Digital Masters are particularly strong in two areas which are digital capability and leadership capability. Furthermore, they affirm that Digital Masters improve their *digital capabilities* by rethinking and enhancing their business processes, consumer interactions, and business models as well as develop excellent *leadership capabilities* that can aid vision and change implementation. Therefore, each of the capability is significant in and of itself, the combination is what make a digital mastery (Westerman, Bonnet, & McAfee, 2014).

The below figure 3 depicts a survey of digital mastery by industry conducted by Westerman, Bonnet, & McAfee in 2018.

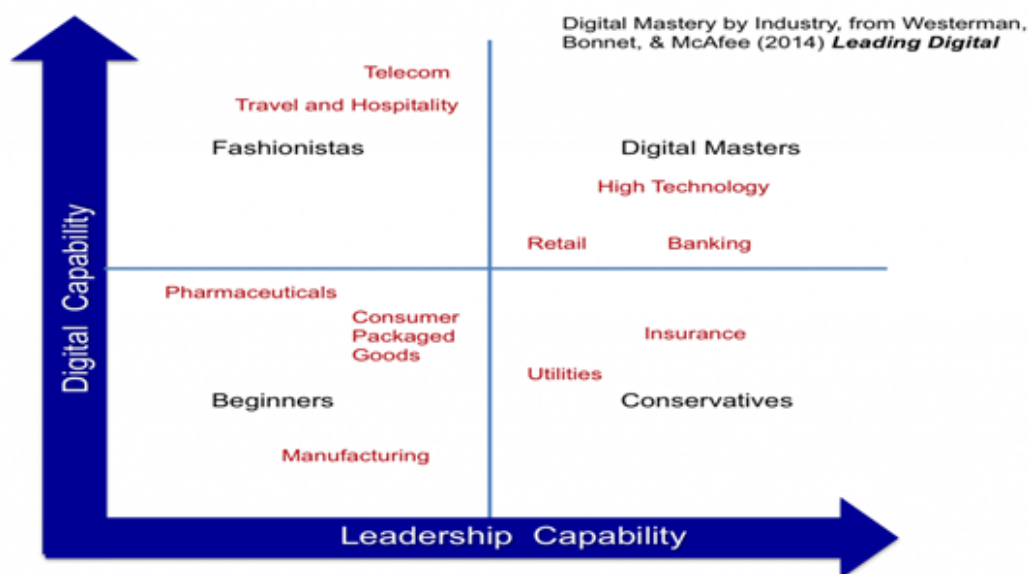


Figure 3: Westerman, Bonnet & McAfee Digital mastery by industry survey

Leadership Capability

The line between business and technology functions blurs in a digital organization, where its leaders confront a significant problem in designing procedures since the structure and backbone of the organization are transitory and developing (Lange, Joseph, & Karner, 2019). In contrast, an organisation with digital vision, its leaders and executives can better recognize dangers and opportunities in their environment, assess their potential impact, adjust present capabilities to these trends, and develop new skills for the future (Dobbs, Ramaswamy, Stephenson & Viguerie, 2014). Even though business leaders are aware with long-term strategic planning methodologies, they are still searching for a method that allows them to make impactful strategic decisions and quickly restructure their resources and capabilities to respond

to short-term shocks (Levallet & Chan 2018). Leadership improvisation necessitates managers' ability to act quickly and creatively in the face of uncertainty in an unplanned manner (Levallet & Chan 2018).

According to Lange, Joseph, & Karner (2019), leaders must recognize, however, that digitalization has the potential to undermine the culture fabric and must deliberately confront and manage the fear that comes with ambiguity and change. In addition, they pointed out that leaders must turn uncertainty into clarity, unstructured occurrences into a developing and flexible framework, as well as to be willing to adapt to change repeatedly. And as Jyoti Shukla put it., "Professionals who have embraced the power of new technologies will do much better than those who may be technically good but have not understood that the world is doing things fundamentally differently." (Personal interview by Lange, Joseph, & Karner, 2019, p.38). Therefore, organizational leaders often need to use their IT infrastructure's flexibility to develop the correct strategic initiatives and be able to move fast (Levallet & Chan 2018).

Digital Capability

It has become a given that digital technology will disrupt almost every sector (Coupey, 2016), but digital strategies are unique to companies and the industries in which they compete (Kane et al., n.d.). Digital technologies are fast altering the way businesses create and provide value to their consumers (Sendino, 2013) because the feedback loop has become so visible and useful, that it positions customers as a factor to be reckoned with in the decision process (Tiwari, 2016). The digital transformation moves value and power away from people whose talents can be replaced by digital solutions and toward those who cannot be replaced by automation (Lange, Joseph, & Karner, 2019). In today's complicated and linked world, the most successful businesses use digital technology to identify and embrace changes quickly, as well as to develop more quickly (Levallet & Chan 2018). Lange, Joseph, & Karner (2019) pointed out that organizations that are digitally aware are continuing to link functions by working with cross-functional teams that have no or flattened hierarchies. While they emphasize furthermore that, culture, rather than technology, is the biggest impediment to digital change.

Similarly, even if an organization's structure has been fully flattened, if its culture is risk averse, it may still suffer (Kane et al., n.d.) because a culture that encourages innovation as well as a flexible organizational structure are required (Levallet & Chan, 2018). Industry boundaries and dynamics are shifting as a result of digitization, where companies must first identify its cultural readiness (Lange, Joseph, & Karner, 2019) to establish the position, they wish to take on the digital terrain in terms of data, services, and devices before they can articulate their digital vision (Booth, Mohr, & Peters, 2016). As a result, successful organizations must cultivate an expansive ecosystem of ideas and experiments that take use of the workforce's perspectives, features, and viewpoints (Lange, Joseph, & Karner, 2019). To develop a digital transformation plan that can be effectively implemented and scaled throughout the organisation, that can be built on the company's current value drivers and strengths, such as its product line, technical expertise, and closeness to customers (Booth, Mohr, & Peters, 2016).

While according to Levallet & Chan (2018) every company is different, those that succeed at improvising rely on a set of digital tools that enable capacity and resourcefulness. Furthermore, they described and categorized digital capabilities into two: Flexible Information Technology Infrastructure and Information Management Capability, which are regarded as being very useful in unpredictable or urgent times.

- *Flexible IT Infrastructure*

IT infrastructure is a broad concept that involve technical and human (Terry & Douglas, 2000) which serve as the bedrock of the IT portfolio that cut across an organisation in the form of dependable services and is often managed by the Information System department (Broadbent, Weill, & St. Clair, 1999). The

technical infrastructure refers to the applications, data, and technological setups that are made while the human infrastructure refers to the decisions made in terms of the knowledge and skills needed to properly manage the organization's IT resources (Terry & Douglas, 2000). Weill, Subramani, & Broadbent, (2002) pointed out that though it is tough to get the proper mix of high-capability infrastructure, and also explained that one of the most difficult challenges confronting organisation decision makers are deciding where to invest in IT infrastructure in which they frequently feel unprepared to make certain decisions. Furthermore, they suggested that putting resources into the perfect infrastructure at the perfect time allows for the quick deployment of future electronic-based business drives, as well as cost savings in the running of operations and information (Earl & Khan, 1994). IT infrastructure competence encompasses both the technical and administrative skills needed to offer dependable physical services as well as wide electronic connection both within and outside the organization (Broadbent, Weill, & St. Clair, 1999). Time, huge resources, dedication, and leadership as well as professional skills are vitally important to build a high capability infrastructure (Weill, Subramani, & Broadbent, 2002). In this scenario, the elements of IT infrastructure flexibility and IT investment should have a positive connection (Terry & Douglas, 2000).

IT professionals who are the personnel with skills and knowledge of technologies (Lee, Trauth, & Farwell, 1995) build, preserve, and replicate their own organizational capabilities since the IT function covers activities that are very different from other business functions (Kim, Shin, Kim, & Lee, 2011) and its capacity to improve organisation's ability to alter business processes (McAfee & Brynjolfsson, 2008). Organizations that invest in and manage scalable, adaptable, interoperable, and modular technology have a more flexible IT infrastructure (Kim, Shin, Kim, & Lee, 2011) because the deployment of more flexible technologies relates to a higher level of technological complexity (Duimering, Safayeni, & Purdy, 1993). Flexibility in IT infrastructure is required to accommodate rising consumer demands without increasing expenses (Weill, 1993) rather IT infrastructure flexibility should be seen as a key skill of an organisation, implying that an effective infrastructure is defined by its ability to change and adapt (Davenport & Linder, 1994). As a result, Terry & Douglas (2000) noted that flexibility allows an organization to successfully regulate even external environments, stating that the more an organisation can control its competitive environment, the greater its chance of achieving a good competitive position. Furthermore, they pointed out that because IT applications have grown more horizontal, as opposed to conventional hierarchical, flexibility in interpersonal and managerial abilities is required such that it needs the development of a new type of adaptive employee capable of dealing with IT implementation and limitation concerns.

- *Information Management Capability*

Organisation resources encompass all assets, capabilities, organizational processes, business characteristics, information, knowledge, and so on that an organisation controls and that enable it to devise and implement strategies to increase its efficiency and effectiveness (Barney, 1991). An organization should possess the organisational capability (Brinkhues, Maçada, & Casalinho, 2014) to examine all these resources as a requirement to carry out its plan, including information (McGee & Prusak, 1994) all to be used in combination (Javenpaa & Leidner, 1998). As a result, according to Brinkhues, Maçada, & Casalinho (2014) information as a resource or capacity might be seen as potentially strategic, with which to realise the strategic value of information, then organisation must create organizational skills to handle it. The experience, skills, and capability for handling IT (Terry & Douglas, 2000) as well as the commitments, and values of the IT experts who implement and manage IT goods and services were all part of the human infrastructure (Henderson & Venkatraman, 1994). Hence, before turning to technology, managing information may be a highly useful method to understanding the strategic elements of information (McGee & Prusak, 1994). In this regard, information management culture (Brinkhues, Maçada, & Casalinho, 2014) requires that, every part in information life cycle starting from detection to

gathering, processing, organization and to maintenance, information must always be evaluated (Kettinger & Marchand, 2011) more with Big Data (Rahul & Banyal, 2020; Lawson, 2013).

Further, from Big Data perspective, adopting a new way to manage information is necessary since information management has become even more important (Brinkhues, Maçada, & Casalinho, 2014). While Mata, Fuerst, & Barney (1995) argues that what is also crucial is the managerial skills that has continued to be a source of strategic difference. This allows the use of real-time information to understand organisation environments at a particulate level and so adapt to changes when it is required (Dav-enport, Barth, & Bean, 2012). The capacity to respond rapidly to market developments is an inherent characteristic of information management capability, because as a strategic resource, information management capability plays an essential role in responding to the demanding change (Brinkhues, Maçada, & Casalinho, 2014).

2.7 Benefits of Data Use

Despite the many barriers, the possibilities presented by data usage outweigh these obstacles (Mandinach, 2012). Along with the resolution of existing problems, data can yield greater value, hence, there is no question that value would be generated by intelligent decision-making based on raw data analytics (Wang, Xu, Fujita, & Liu, 2016). With data, important knowledge about a company's strengths and weaknesses, some of which may require urgent attention can be exposed, as well as hints about how to organize instructional plans to address those needs can be gathered (Mandinach, 2012). In addition, if data is properly conceptualized and implemented, it may also answer the formative question of how to develop a program or proper solution (Mandinach, 2010a, 2010b). It is the ideal time for DDDM based on the new and growing attention given to technology and the increasing focus on using data to guide practice (Mandinach, 2012), in which Easton (2009) had submitted that DDDM is seen as a cyclical or iterative method of defining an issue, deciding what solutions is applicable to a problem, tracking the execution of the solution, and targeting “research” to see whether progress is being achieved, regardless of the form of data, the intent, or the position of the user. Furthermore, Mandinach (2012) is of the opinion that making sense of data is dependent on the reason for which it is gathered and analysed, as well as the user's position. Meaning that when managers is posited with access to a huge volume of data (Brynjolfsson & McElheran, 2016) with the help of emerging technologies (Wayman, 2005, 2007) or the data team (Mandinach, 2012) good data will allow for a more informed and intelligent decision-making (Brynjolfsson & McElheran, 2016) at every level of the process (Wang, Xu, Fujita, & Liu, 2016).

Gill, Borden, & Hallgren, (2014) describes the benefits of data use in three ways; data infrastructure, analytic capacity, and the culture of DDDM. In terms of **Data Infrastructure**, when an organization can successfully capture, transmit, and manipulate data which is dependent on the creation and advancement of data system by building of a systematic procedure for collection, processing and storing these data, thus, it will ensure data quality and security of customer’s information (Gill, Borden, & Hallgren, 2014). Further, they explain that developing a data infrastructure will include to acquire new devices or upgrade of technological hardware such as servers, computers, internet connectivity etc. which can help to establish link between disparate dataset and that will make analysis process easier, as well as ensuring data access and management process with a smooth run that will make data available to use in real time for the decision makers (Gill, Borden, & Hallgren, 2014). For **Analytic Capacity**, this may involve partnering with an external consultant to do value-added assessments or develop a district's electronic data

infrastructure, depending on the organization's capability (Gill, Borden, & Hallgren, 2014). They also mentioned that it will potentially encourage training of workers and staffs with the ability to access and use data in different capacity such as: Implementing data-driven decision-making processes, learning how to view and interpret data, using data to improve instructional practice, and data processing and data protection. On the *Culture of DDDM*, they, ascertain that good leadership and accountability processes will effectively support the data use. Further, they articulate the role of leadership as enacting policies that will enforce and monitor DDDM procedure and management use of data system. Similarly, by having a specific goal or action plan for DDDM, leaders will maximize the probability that data can be used (Gill, Borden, & Hallgren, 2014).

2.8 DDDM Culture in Tourism Management – case of National Parks

Being impacted by the covid pandemic, Kenya adopted a digitization strategy that has foot hold in the DDDMC practices. For instance amongst the key strategies Ministry of Tourism & Wildlife (2020) proposed “Knowledge and Experiences Capturing and Sharing for Kenya Tourism Industry” (p.7) which is rooted in DDDMC practices based on the conceptual model presented in (fig.1). It further believes that once right knowledge is obtained or identified at the right time it will support decision making (Ministry of Tourism & Wildlife, 2020).

In Belgium Shaker et al., (2021) presents a digital tool that aids both information capturing and sharing for the national park visitors and managers of protected areas. Since data is central to the DDDMC, Hoge Kempen National Park in Belgium sees the need to introduce an app which “...will provide an interface to collect the data about the visitors’ trajectories” whereas “...rich data that is valuable for visitor management purposes [decision making purposes] ...” (Shaker et al., 2021, p.1&17). Further, based on their findings in the Denmark National Parks, Larsen et al. (2008) concludes that one aspect of DDDMC-data driven analysis offers valuable information for decision making process and also serves as the foundation for determining strategies for biodiversity preservation and recreational values.

Conclusively, tourism management practices such as master planning, facility usage, and impact assessment requires data input for proper decision making. Already the tourism sector has witnessed a number of changes that forces the general decision-making practice to be based on data. Establishing a DDDMC will not only aid decision making practices but also provides national parks with an added value from the data it houses. One essential component of tourism management – tourism marketing has already received some transformation with big data analytics and predictions. It is essential for the national parks to fully realize the potential of DDDMC for their strategies and policy formulations.

2.9 Challenges to Data Use

Like any other approach, the use of data also presents both challenges and opportunities (Mandinach, 2009a, 2009b). DDDM is plagued with many problems and difficulties, therefore, it is not regarded as a cure-all (Mandinach, 2012). Data are a promising foundation for creating smart tourism and to generally improve tourism organizations' ability to personalize their product and service offerings, however, the real-world use of such ground-breaking data-driven value generation models in tourism is only limited to theory or a few exceptional instances (Ardito, Cerchione, Del Vecchio, & Raguseo, 2019). Sharma, Mithas, & Kankanhalli (2014) pointed out that despite the compelling evidence that there are

many benefits of using data-driven information to guide decision-making, experience shows that this knowledge does not necessarily lead to successful decisions. Especially, if data is poorly evaluated or interpreted that led to skewed, invalid inferences, causing decision makers to draw the wrong conclusions (Gill, Borden, & Hallgren, 2014). Knowledge, expertise, and dispositions conducive to structured collection, processing, and understanding of relevant data are therefore needed for effective shared decision-making (Reeves & Burt, 2006) all of which are time consuming and expensive (Mandinach, 2012). Wang, Xu, Fujita, & Liu (2016) argues that the challenge in developing a system architecture which includes the system architectural design, processing modes, computational system, and energy-efficient processing platform, to help decisions in managing a variety of complex data and perform complex Big Data computations is of a great concern. Furthermore, they emphasise that, assessment and enhancement of such energy-efficient handling framework is a major challenge.

From Mandinach (2012) standpoint, some of the data use challenges can be classified into: **Research Related Problem**, it is neither a simple study subject nor one that can be quickly applied in reality wherein there are few options for funding work on DDDM, which limits the study pipeline, thus for practitioners that are only getting started with data-driven methods, doing thorough (experiment design) analysis can be challenging (Mandinach, 2012). However, Mandinach (2012) suggested also that the practice must be reflected in the study while this viewpoint was corroborated by Means & Colleagues (2011) that collaboration on study of data use may serve as a medium for valuable professional discussion. **Lack of Human Capacity**, the lack of human resources surrounding DDDM is a problem that has a greater effect on practice than on research (Mandinach, 2012). Non-technical difficulties arose more from management issues with service providers and users, rather than technical issues with data processing (Wang, Xu, Fujita, & Liu, 2016). Therefore, human skill continues to play a vital role in decision-making, which cannot be replace with data usage or processing in management models (McAfee et al., 2012). **Data Literacy**, there are not many standardized DDDM courses available (Mandinach, 2012) as well as access to a decent career learning opportunity is limited (Means, Padilla, & Gallagher, 2010). A similar concern is that there is no strong consensus on the definition for data literacy or how the construct can be operationalized (Mandinach & Gummer, 2011b) whereas a deeper understanding of the data literacy construct is needed (Mandinach, 2012) as a guiding principle for proper application and implementation of data.

3 Methodology

This chapter details an explanation of the strategy and methods undertaken in this study. It elaborates the research strategy, data collection and data analysis approaches and the justification for their use is provided. Further, subject to research quality, ethical consideration and scientific quality relevancies are discussed.

3.1 Research Strategy

In this qualitative study, perceptions and expert's opinions were gathered in the context of data driven decision making culture (DDDMC) as the main theme and what influences their decisions in certain scenarios. The aim was to answer the research question: - "How can Tanzanian National Parks build a data driven decision making (DDDM) culture for tourism management" which can be achieved by understanding the current decision making practices and stumbling blocks towards a fully data driven culture. DDDMC has received little attention and not fully explored in the field of information systems which is the justification for Recker's (2013) argument for qualitative method being suitable for a study where complex phenomena are not fully well known, clearly defined, or still emerging.

This study also employed a single and holistic case study design because it represents a critical test of the adopted framework (Yin, 2018). Based on the literature more attention has been on marketing segmentation (Dolnicar, 2008; Dolnicar et al., 2013; Mark Anthony Camilleri, Ratten & Cruz Del Rio-Rama, n.d.) advanced technological applications such as analytics and big data application (Matthews et al., n.d.; Provost & Fawcett, 2013) but less has been on DDDM as a whole in the given context.

Along with its integrated nature, interpretivism is the best paradigm for understanding in-depth human acts, experiences, and behavior in qualitative studies (Thanh & Than, 2015). This study's goal is to explore the decision-making culture through insights from field experts' perceptions which contends to interpretivism paradigm. Further, conclusions will be drawn based on systematic literature review and analysis of the empirical findings for the purpose of adopting existing DDDM frameworks.

3.2 Research philosophy

To support the methodological claims related to our research problem, both ontological and epistemological positions were adapted in our study. Ontology is concerned with 'what kind of situation we assumed is exist', which means the basic block that creates the phenomena or investigates the objects and on the other hand epistemology is concerned with what we want to know about the nature of knowledge and find the proper methods for investigation (Iivari, Hirschheim & Klein, 1998). In this study, the ontological assumption was there is a decision-making culture which is not fully based on data even though data is being collected and exists. Another assumption is decision makers do not have a full confidence to rely on data because of several factors such as low data quality, lack of data culture or vision from the top leaders and low digital capability at the national parks. Therefore, our epistemological approach is finding out or gaining insights on the experiences of tourism officers at the park level and headquarters' level on their decision-making practices and the basis of their decisions which will inform the researchers on loopholes and strategies for designing a framework for DDDMC through in-depth interviews, observations, and literature review. In interpretivism, ontology and epistemology are interrelated with each other (Goldkuhl, 2012).

To obtain deeper insights and knowledge on this phenomenon (experiences of tourism professionals') interpretivism research philosophy is sought to be the best in this scenario. The reason behind choosing this philosophy is that, with the interpretivism perspective, the researcher tries to understand the people's actions and experiences which means that how they perceive or imagine the world and how to convey their knowledge among themselves Easterby Smith et al. (2002 cited in Kankam, 2019). Goldkuhl (2012) explain that the interpretive researcher heavily relies upon the opinions and views of the contributor on the subject that are being investigated. Therefore, this paradigm will give us the foundation to interpret the knowledge of other's feelings and thinking about DDDM culture. Furthermore, the interpretive paradigm overcomes the biasness in studying with others' interpretations because "...it provides diverse ways of seeing and experiencing the world through different cultures and context" (Pham, 2018, p.3). Also, interpretivism gives us a holistic view of the studied area, rather than the understanding of its different segment (Goldkuhl, 2012).

By studying the interpretivism on literature, we come at that point the interpretive researcher should consider the fact that interpretivism relies heavily on different data collection methods such as interviews, observation, and literature review. We tried to collect qualitative data through the interviews, observation and literature review in our research which allowed us to investigate and give better insights into the phenomena for future action. Goldkuhl (2012) describes that the relationship which is built between the researcher and the practitioner leads to the success of the interpretive research.

3.3 Research Process

It is critical to follow a defined and planned research procedure when performing a research project (Yin, 2018). As illustrated in figure 4 below, this study commenced by selecting a research theme prior to initial literature review. Karlsson (2009) argues that conducting initial literature review can generate insights and general view of the existing literature which is crucial for defining research objective. This provided us with an overview of what is already known and the existing research gaps in DDDMC.

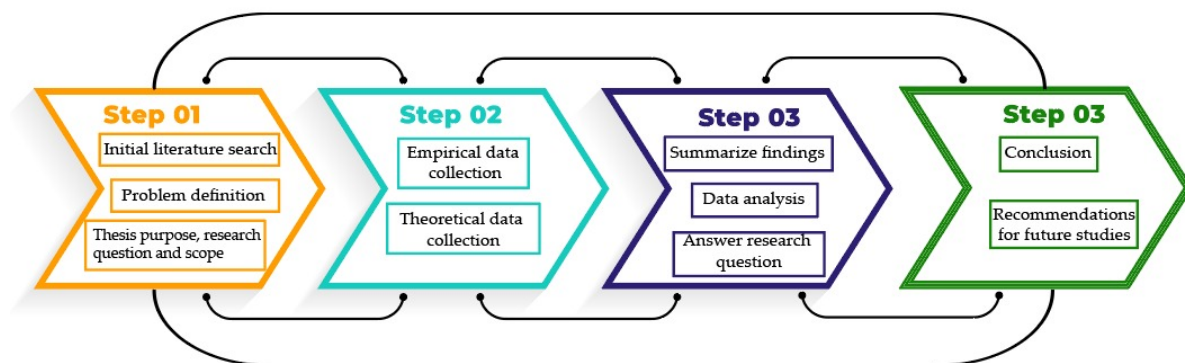


Figure 4: Research Process for this study

3.4 Data Collection

Data collection in this thesis is both theoretical and empirical. This section explains how the data for this study was gathered and used.

Literature selection

To provide this study with theoretical data, a literature review was conducted. As explained by Cresswell (2014) that literature review entails locating and summarizing existing studies related to a particular phenomenon. Yin (2018) emphasizes the necessity of first developing a strong theoretical knowledge of the researched study field in order to construct a suitable research design. Investigating the application of a data driven decision making culture in tourism management, a literature review was conducted following the exploratory research principle. Having identified and develop a research question, which is specific to behavior or phenomena (Bhattacharjee, 2012) in tourism. The literature review purpose baseline went in three-folds in accordance with Bhattacharjee (2012). Firstly, is the literature selection to assess the existing state of knowledge in the domain of interest (Bhattacharjee, 2012) an approach that is corroborated by Recker (2013) position that the significance of the literature review stems from the comprehension of the present state of the research problem and existing hypothesis as well as research methodologies. Using this approach, to find and summarize available research on the specific subject (Creswell, 2014) Google Scholar and LUBSearch, Lund University's online library, were used as primary sources to pick useful scholarly studies. Secondly, was to illustrate the most important discoveries and hypotheses in the subject area. The final step was to determine where in the literature was a knowledge gap.

To perform the search and selection of articles, according to Bhattacharjee (2012) computerized keyword searches of web libraries or databases are widely use in today's literature. Therefore, the following queries were used to identify important and relevant literature from these abovementioned sources:

- (“Data” OR “Data-Driven”) AND (“Decision Making” OR “Data Driven Decision Making” OR “Data Driven Decision Making Culture”)
- (“Data Use” OR “Data for Decision Making”) AND (“Benefits of Data Use” OR “Advantages of Data Driven”)
- (“Challenges to Data Use” OR “Risks of Data Use in Tourism”) AND (“Data Driven in Tourism Management” OR “Decision Making in Tourism Management”)
- (“Data Driven Culture” OR “Decision Making Culture”) AND (“Data Driven Decision Making Culture” OR “Data Driven Decision Making Culture in Tourism”)
- (“Tourism Management” OR “Tourism Development”) AND (“Tourism Sustainability” OR “The Role of Tourism Management” OR “The Impact of Tourism Management”)

Table 2: An example of Literature extract results

S/n.	Theme	Author (s)
1.	Data Culture	Maxwell, Rotz, and Garcia (2016); Mandinach, E.B., (2012)
2.	Decision Making	Taylor, J. & Purchase, J. (2016); Provost and Fawcett (2013);(Kumar, 2017); (Müller, Fay & vom Brocke, 2018);(Cai & Zhu, 2015).
3.	Data Driven	Treder, M. (2019); Anderson, C. (2015).
4.	DDDM: Data level, Information level, Knowledge level	Mandinach, E.B., (2012); Ikemoto & Marsh (2007); Abbott, (2008); Mandinach, Honey, Light, & Brunner, (2008)Mandinach, E.B., (2012); Ikemoto & Marsh 2007; (Schuh, Anderl, Gausemeier, Hompel, & Wahlster, 2017); (Moser & Korstjens, 2017); (Barring, et al., 2018); Morbey (2012)

5.	Challenges	Sharma, Mithas, & Kankanhalli (2014) (Gill, Borden, & Hallgren, 2014). Wang, Xu, Fujita, & Liu (2016) Mandinach (2012)

Finally, some of the retrieved articles also provides the authors a secondary lead way via its reference sources which were followed. And according to Randolph (2009) when researchers dig at the sources that were included within the papers they covered, they would be able to gain further insights. This is precisely what we did from the start of this study as part of our literature review approach because it allows us to quickly recognise critically acclaimed articles in our area of interest. Subsequently, these secondary articles enabled us to broaden our awareness of various aspects and concepts related to our research subject. We contend that this approach, in addition to looking in conventional articles and reviews, increases the consistency and agility of our literature review.

Case study selection

Given the fact that this is a case study of Tanzania National Parks, the authors considered the option of interviews, which will offer rich insight knowledge dependent on informants' feelings, emotions, and opinions (Oates, 2006). Interview can be distinguished from other research approach or method because of the involvement and participation of the interviewees for a comprehensive and fist hand facts (Polkinghorne, 2005). Schwandt (2001) explained that the aims of qualitative interview-based research method is to give a concise descriptive definition of humans' experiential life, according to the way life is lived, encountered, perceived, understood, and achieved by individuals. While qualitative research interview has continued to be appreciated and practiced in different fields, and particularly in information systems (IS) (Schultze & Avital 2011). In contrast, Myers, and Newman (2007) claims that interview is an unexplored technique in information system for data generation.

The case study involved data collection at the national parks in Tanzania over a time period of 12 weeks. During the last 8 weeks, one researcher was physically at different national parks 1-5 days per week, mostly for eight-hour days. This allowed for attending monthly and weekly meetings and participating in several daily informal meetings, which provided a deeper insight of the studied case. Apart from the afore mentioned interviews as data collection technique, observations, and collecting documentations were done.

Informants' selection

This study invited respondents by email from different National parks and TANAPA headquarters with an intended sample of 20 tourism and system experts. Amongst invitees are those that spent at least two years and above in the field with the purpose of striking the balance between the experienced personnel and non-experienced in the field of tourism management with the target of drawing their experiences and opinions on their managerial practices. Out of the 20 intended samples, only ten (10) experts were available for an in-depth interview discussion. Due to geographical limitations some interviews were cellular based phone interviews with the highest duration of 75 minutes led by one researcher. The interviewer had broad experience and interest in the phenomenon in question based on his working experience in the similar organization's setup. Below is a table with the details of the interviews that was conducted: -

Table 3: Summary of scheduled Interviews

Informant Code	Role	National Park	Experience	Medium	Duration
Info1	Senior Tourism officer	A & Zonal	10 years	Phone	40 min
Info2	Tourism promotion Assistant	B	2 years	Phone	25 min
Info3	Senior conservation ranger -tourism	C	8 years	Phone	35 min
Info4	Senior conservation officer -tourism	D	8 years	Phone	33 min
Info5	Tourism officer	E	13 years	Face-to-face	50 min
Info6	Tourism officer	F	5 years	Face-to-face	40 min
Info7	Head of tourism department	G	18 years	Face-to-face	1hr, 10min
Info8	Tourism officer	Headquarters	4 years	Phone	40 min
Info9	Senior Tourism officer	Headquarters	13 years	Face-to-face	1hr, 15min
Info10	IT Technician	Zonal	5 years	Face-to-face	43min

Interview guide

To allow for flexibility and improvisation, as well as to encourage communication between the two parties (Recker, 2013), a Semi-structured interview guide was designed, piloted, and used based on the adopted conceptual framework (figure 1). We presumed that, semi-structured interviews are the best fit for our research because we want to perform the interviews in a more conversational and versatile manner, allowing us to extract deeper perspectives by posing follow-up questions if required (Recker, 2013; Patton, 2015). Interviews were recorded with the informant's consent and transcribed in whole, and informants were not consulted for their corrections or comments. All interviews' sessions started with debriefing in order to familiarize each with flexibility guides and follow-up questions prompting for the right answers.

Table 4: Sample Interview guide based on framework themes (in figure 1)

Theme	Sample Question
Data Level <ul style="list-style-type: none"> • Data Collection • Data Organization 	<ul style="list-style-type: none"> • If you can take decisions to improve the (tourists experience) what data/information would you like to have? • How would you collect this data? When and where? • How would you get feedback from tourists? • How would you organize/consolidate the data collected?
Information Level <ul style="list-style-type: none"> • Analysis • Summarization 	<ul style="list-style-type: none"> • What would you need to analyze the data once it is collected? • What is missing to analyze the data you collect today? • How would you present the data once it is analyzed?
Knowledge Level <ul style="list-style-type: none"> • Synthesis • Prioritization • Implementation and Impact 	<ul style="list-style-type: none"> • Would accessing this data, improve your ability to act at your level? • What is your opinion on the usefulness of this data for your daily decisions? • Once you implement your decisions (based on data), how would you know they work?

	<ul style="list-style-type: none"> • What would be the stumble blocks/challenges in the organization to decide based on data?
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Table 5: An overview of data collected at the case study

Technique	No	Duration (Minutes)	Type of data collected
Semi-structured Interview (round one)	4	25-40	Decision making culture, decision basis, data collection, processing, impact, challenges, and existing gaps
Semi-structured Interview (round two)	6	40-75	Organization culture, decision making practices, data collection, processing, impact, challenges, existing gaps, technology applications
Participant Observation: <ul style="list-style-type: none"> • Entry gate operations • Informal conversations • General System operation (reservation) • Various meetings 	Daily Daily Weekly 7 meetings		Information related to data collection, feedback, understanding tourism operations Opinions and challenges Data collection, organization, and processing Decision making practices and the use of data in decision making – potential improvements, achievements, and information about the overall tourism department performance at the park
Documents	4		Information about the national park strategies, operations, plans, targets, data available, data sources available, software applications, and general performance

3.5 Analytical approach

Interview transcription was done immediately after each interview through Nvivo Software which allowed control over the recorded files and in order to ensure accuracy and all information captured, controls such as pausing and rewinding the recording while writing was done. By this we ensured that quotes and informants message has not been misinterpreted during the analysis at later stages in this thesis (Bhattacharjee, 2012). Verbal conversations were transformed into written texts in the transcripts that are in the appendices. Due to anonymity request from the respondents' real names of the respondents and their respective national parks were replaced by Info*Number and National Park*Alphabet hence easily identifiable without distorting the response.

After the transcripts were prepared a software tool (Taguette) was used for coding which allowed collaboration with other co-researchers. According to Recker (2013) qualitative research generates a large amount of qualitative data, which is difficult for the researcher to interpret owing to time constraints and inexperience. Nonetheless Bhattacharjee (2012) emphasizes on sense making qualitative analysis as most appropriate method and models such as Miles & Huberman’s (1994) flow model exists in support of this emphasis. In this study the Miles and Huberman’s (1994) flow model was adopted (figure 5).

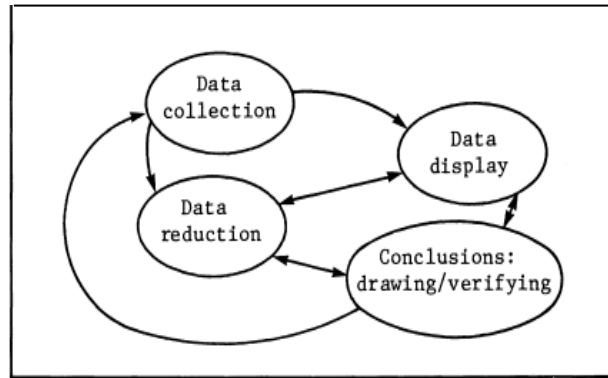


Figure 5: Data analysis Flow Model (Miles & Huberman, 1994)

As seen in figure 5 above the model suggests that data analysis should be done on different stages such as data reduction, data display and conclusion, and in this study the researchers adopted this model in data analysis. Coding scheme (table 6) was developed as the data reduction technique tool (Miles & Huberman, 1984; Recker, 2013) and was derived from the DDDM conceptual framework (Figure 1) which was also derived from the research question. Below table 6 represents the coding scheme and table 7 is an extract of the codes from the interview transcripts.

Table 6: Coding scheme

Code	Framework Themes
<i>Cul</i> Cul-dat Cul-non	Theme 0: Culture (decision making culture) <ul style="list-style-type: none"> • Data based • Non-data based
<i>Dat</i> Dat-col Dat-org	Theme 1: Data Level <ul style="list-style-type: none"> • Data collection • Data organization
<i>Inf</i> Inf-anl Inf-sum	Theme 2: Information Level <ul style="list-style-type: none"> • Analysis • Summarization
<i>Knw</i> Knw-syn Knw-pri Knw-Impl Knw-Impt	Theme 3: Knowledge level <ul style="list-style-type: none"> • Synthesis • Prioritization • Implementation • Impact
<i>Chall</i>	Theme 4: Challenges

Table 7: An extract of the coded part of the interview transcript

3.	Researcher	I wish to know, what are the basis of the decisions you make in your department?	
4.	Info9	We as a government institution we have guidelines that guide our operations and there are data which are used in the process. For the past years that I have been doing this job, there has been data that we use in many areas. Let me start with the area of my expertise, for you to know this is a potential market (growing, mature, or declining) you must obtain data – of course it is historic data, there is some data that we have in our databases and that which we get from UNWTO projections	Cul-dat Cul-non Dat-col Krw-syn Krw-impl

Furthermore, as argued by Kvale & Brinkmann, (2009) coding was done to provide form to our interview transcripts and make it easier to identify out hidden definitions. Based on the themes identified on the literature in figure 1 concept driven coding was done as elaborated by Kvale & Brinkmann, (2009) that coding could be concept driven or data-driven by looking into existing literature or model.

Following the data analysis flow model, another step was data display which entails displaying structured data in order to better comprehend the phenomena under investigation (Miles & Huberman, 1994). In this study use cases were used to assess the knowledge application – synthesis at the knowledge level of the DDDM framework and also to understand informants' confidence level on the processed data. In addition, validation of the conclusions was attained by sharing the transcripts with co-researchers (one internal and an external research expert) and key themes and concepts based on the adopted DDDM framework (figure 1) were used in coding. The leading author conducted an in-depth review and analysis of the data and discussed with co-researchers the themes, data narratives and thick description was attained, and consensus achieved.

3.6 Validity and Reliability

Patton (2015) argues that “[t]he credibility of your findings and interpretations depends on your careful attention to establishing trustworthiness” (p.685). In ensuring credibility, there is a need to conduct a quality assessment of whether the data accurately and fairly describe the phenomenon understudied (Holloway, 2005). This study involved in-depth data collections methods such as in-depth interviews and observations which requires experienced interviewers with specific skill to establish resonance with interviewee (Crabtree, Crabtree & Miller, 1999). The researchers specifically debriefed informants before conducting these interviews familiarizing each with flexibility guides and follow up questions at the right time to call forth right answers.

Validity refers to whether the conclusions accurately represent the condition under investigation and are backed up with evidence. Also, "Valid measurement represents the essence or content upon which the construct is focused" (Recker, 2013, pp.70). As explained by Patton (2015) this may be parallel to credibility (internal validity) – relationship between respondents' views and researcher's reconstruction and transferability (external validity)- “generalization in terms of case-to-case transfer” (p.685). As described by (Lee and Baskerville (2003) generalization “...refers to the validity of a theory in a setting different from the one where it was empirically tested and confirmed” (p.1). This study focused on internal validity (credibility) - where literature review in the field and theme of DDDM was conducted to obtain in-depth knowledge about the subject, through which the basis for our interview guide was

established; and external validity (transferability) – where this study selected the respondents (tourism officers) who have in-depth the knowledge in the national park tourism operations and are more exposed to decision making practices in their line of duty. Further, the interviewer has working experience background with similar sister organization which availed a deeper understanding of the case study. This allowed the author to validate answers based on prior understanding of the organizational setup.

Reliability is achieved when the conducted study can be repeated and still arrive the same results. Patton (2015) claims that reliability “focuses on process of the inquiry and inquirer’s responsibility for ensuring that the process was logical, traceable, and documented” (p.685). In this study, researchers ensured reliability by selecting the respondents (tourism officers) who work in the national parks and make decisions in their line of duties. Further, the interview questions were derived from insights from the literature and conceptual framework (figure 1) which ensured the questions are relevant to the study. The level of ambiguity and the risk of misinterpretation was reduced by the researcher asking questions that respondents were familiar with and the interview wording was simplified (Bhattacharjee, 2012). For evaluations and transparency and ensuring reliability and trustworthiness of the study, section 3.3 and figure 4 details how the research process was conducted.

3.7 Ethical Considerations

Qualitative studies that involve interviews offers valuable and insightful information but for respondents it is always not suitable as it involves giving up their anonymity (Recker, 2013). Ethical considerations along with withholding participants names and identities were key to this study and participants were assured of their anonymity and confidentiality, voluntary participation, and holding on to promises made prior to the interview sessions as argued by several authors (Oates, 2006; Patton, 2015; Recker, 2013).

There are some key ethical issues that must be addressed for our empirical investigation. We will clearly clarify the goal of the research and how the information will be used before conducting the interview inquiries, and we will seek for consent from the participants to proceed. This is what Recker (2013) emphasizes when he discusses the ethical relevance of obtaining the true permission and interests of all participants, as well as a guarantee not to misuse the data gathered from them.

Recker (2013) further emphasizes the significance of clearly expressing that participant have the ability to withdraw at any time and have all of their data destroyed prior to the study's end. We agree with this viewpoint since our empirical study has the potential to expose sensitive data that participants may be hesitant to reveal. We also believe that saying this to our participants would encourage them to be more open and comfortable, resulting in richer results.

As previously said, we will be conducting interviews as part of our research, and our goal is to collect as much data as possible for our study. When doing so, it's necessary to push the participant for more information; nevertheless, pressing for additional information might cause discomfort or anguish for the participant in some circumstances. Patton (2015) discusses this, arguing that the interviewer must weigh the worth of the possible data with the participant's possible distress. Patton's (2015) recommendations for dealing with this include sensitivity and incorporating the participant in the choice of how far to go in the interview; he also offers comfort and the pledge to erase anything undesired, all of which we shall incorporate in our own research.

4 Empirical Results

This chapter presents the empirical findings of the studied case. It involves results from the semi-structured interviews and secondary data (national parks general management plans, and annual report) that were obtained in the course of this research and the findings are further categorized into themes that were adopted from the theoretical framework described in figure 1

Introduction to the studied case

The studied case was Tanzania National Parks which is a collective management of individual national parks in the country, and since established it has grown into 22 national parks covering approximately 99,306.5 square kilometers². Although sustainable conservation of national parks is the core business of TANAPA, it is stated that "...wildlife tourism is the main source of income that is ploughed back for management, regulation, and fulfillment of organizational mandates"³, thus this study mainly focused on data driven decision making culture for tourism management. Tourism management both at the parks and headquarters involves but not limited to tourism development – revenue management, product diversification, international and domestic marketing, and promotion, and managing tourists' attractions and visits in the park (Info8:6). The study focused on decision making culture both at the parks and the headquarters level. More specifically operational decisions and strategic decisions both by (that involve) individual staff, park, and headquarters level. The study on DDDM culture was critical for the national park effectiveness as they have an impact on products and activities and the diversification of tourism experience which TANAPA embraces. As stated in TANAPA website:

"The Organization continues to embrace tourism as its main source of revenue for its operations. For that reason, TANAPA continues to ensure that more tourism products and activities are developed and promoted to diversify the tourism experience in the parks" (TANAPA, 2021)

Observed from the organization structure and chain of command of the organization exercise two kinds of decisions, the strategic decisions which are at the headquarters level and operational decisions which are at the parks level as shown in figure 6 below.

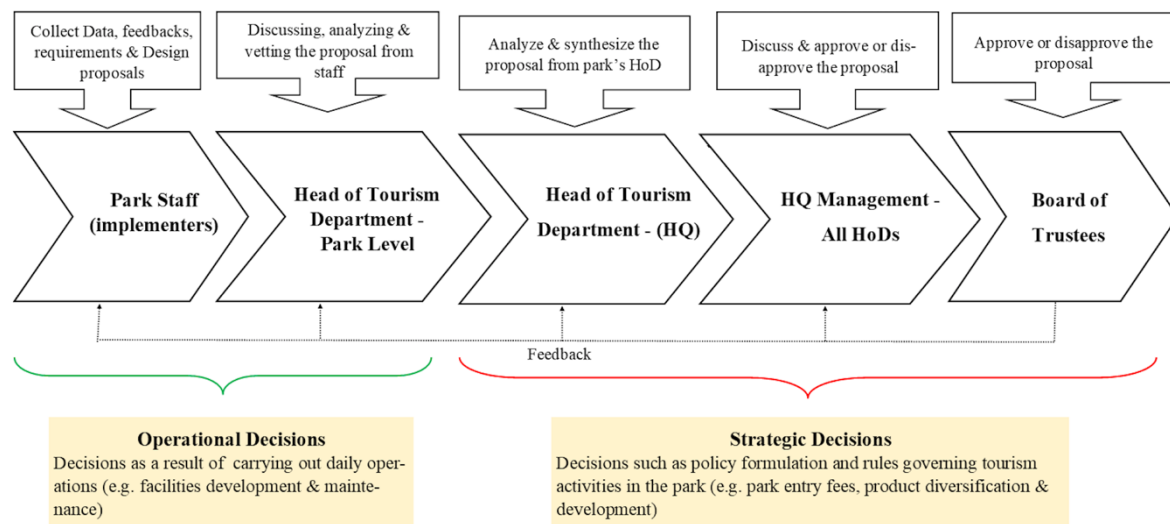


Figure 6: Studied Decision Flow

² <https://www.tanzaniaparks.go.tz/pages/history>

³ <https://www.tanzaniaparks.go.tz/pages/history>

Findings from case study revealed that there were two different decision levels: decisions at the park level and at headquarters level. At parks level decisions such as those concerning provision of required services to visitors, facilities development and maintenance, and marketing and promotion of the parks were observed and at the headquarters level and as confirmed by one of the informants from HQ *“We...[p]repare Prepare guidelines and policies that govern the park’s tourism operations”* (Info8:6).

In figure 6 above, taking an example of product development or diversification, parks staff would design a tourism product based on advises from visitors, tour operators or private investors (Info6:8,10), then discuss this proposal with the head of department (during meetings), the head of department will forward this proposal to head of tourism department at HQ who will then discuss it with the C-suite (management) and at this level the management can decide to end there and give feedback of their decisions or carry it further to the Board of trustees if deemed necessary, at the board level decisions made are final and will be communicated retrospectively.

Current Decision-Making Culture

Initially in the interviews, informants were questioned about their decision-making practices on their daily basis. As this was not part of the adopted framework themes, the main aim here was to map the existing decision-making culture and to determine whether it is based on data or other foundational principles such as the national park’s general management plan (GMP). The responses received were eye opening and was ideal in setting out the tone for the rest of the conversation.

Info7 and Info8 insisted that decisions concerning tourism activities at the park were made based on established guidelines and principal documents such as GMPs, tourism operational manual, marketing manual, government directives and quality management manual: -

“We have guidelines many of them such as GMP which has categorized the resources and activities that are to take place in the park, we have marketing manual, tourism operation manual, quality management manual, standard operating procedures etc.” (Info7:6).

“...most of organization in the government are being led by guidelines which are put forward and so are we, for instance if it is to prepare a new product, you must consult the GMP on the park to see what is required so it is a must to follow the guidelines...For example, you see things now moving into digital, for now when we started digital move, the government gave out directives towards this move and all the organizations under it prepare their plans and strategies based on the government directive” (Info8:4)

One tourism expert from HQ added that, apart from the established guidelines, they use historic data from several databases such as UNWTO database, Internal database and the Ministry’s database as the informant reported: -

“...for you to know this is a potential market (growing, mature, or declining) you must obtain data – of course it is historic data, there is some data that we have in our databases, the Ministry of Natural Resources and Tourism (MNRT)’s data and that which we get from UNWTO projections” (Info9:4)

Info1 who was a senior tourism officer shared his experience on the decision-making practices. He reveals that decisions made have been a daily practice which is based on their experience, the seasonality and availability of funds: -

“...we take these as are our daily activities, they are in line of duty, so we have to promote if we have funds and also in high season like December, we do promotion...” and *“...we know by experience what is always needed.”* (Info1:6)

On the other hand, Info2 who had the least experience in the national park (only two years) revealed that he has been basing his decision on skills and expertise acquired during his formal college trainings:

“I have decent guiding skills, and I acquired my skills based on the kind of tourists ... I have good skills for making them satisfied. I got the skills from the college.” (Info 2:6)

Other officers - (Info3, Info5 & Info6) revealed that part of his decisions has been based on the interests of the visitors and the data obtained from the booking register and the other part on his experience and intuition: -

“...these depend on the interests of the visitors because we have a range of activities that we believe visitors will like...we get to know their interests, so it is through those interests that we decide on the guide activities for the next day... I also use the booking book... based on my experience there are some decisions I will use my skills and experience to decide on the right one” (Info3:6)

“We consider the needs of investors, we have sources of attractions, so if the investor is interested in investing in any, we allow them to do that” (Info5:12)

“We look at the area, if we see they are attractive we consult the department of ecology to analyze the environmental impact, and if it they say it’s okay, we request funds and open the route” (Info6:8)

Nonetheless, an experienced officer (Info4) adds on to what other informants have said, decisions are based on his experiences and skills and expertise acquired during the formal training: -

“...it can be experience on the daily base activities...[b]ut me as a professional there are some things that I can see that I need to decide ...[t]hese are professional skills I acquired during training and the experience at work...” (Info4:6)

4.1 Data Level

Data Collection

After finding out about the existing decision-making culture, informants were asked on what kind of data would they need given a situation that requires decision making such as improving tourist experience, increasing number of tourist visits, product diversification, marketing and promotion or enhancing the booking systems. The main aim here was to assess the level at which data was important and needed for decision making which further led to questioning on how that data was collected or gathered.

Info1 indicates that to undertake some decisions such as increasing the number of tourists or improving their experience, he would require data such as their cultural background and where they come from for instance USA or Europe or any other nation and would need to establish their interest or specifically why did they choose this national park (Info1:8). In line with this Info2 added that he would need the number of tourists who will visit the park, where they come from, whether residents or non-residents and to know their interests (Info2:8).

Unlike Info1 and Info2, other informants indicated that they would need to know their customers in advance alongside knowing their interests, they would need to know the type of accommodation they would require, date of arrival and how many nights the visitor will spend (Info3:8 and Info4:8). In

addition to that, on improving visitors experience and satisfaction, Info4 added that “...*I like to have data on facilities that have to be renovated or to be changed*” (Info3:8).

Having established the type of data that is needed for decision making, the informants were asked on how they would obtain this data or what were their data collection mechanisms. One common way of obtaining data was by “*word of mouth*” especially during the first orientation with the visitors: - “...*we collect this data when they arrive at our park, we give them orientation and ask them their interests...*” (Info1:10), and “...*sometimes direct talk to the customer or their tour operators at the main gate...*” (Info4:10). In addition to that Info1 mentioned that another way of gathering data from visitors was through the activities they prepare for the visitors, meaning if they like the activities it is an indication that others of that same cultural background will;- “we prepare a number of activities for them, varieties which we think might fit all the visitors... so obvious visitors will like any of these activities and they will also tell us during the events and activities” (Info1:10).

Other data collection means reported by the informants included direct phone calls and emails (Info3:10 & Info4:10), WhatsApp group and booking book/ register, (Info3:10), Instagram and Facebook pages (Info1:12), and visitor’s comments book (Info2:15; Info1:12; Info3:12; Info4:12; Info5:16; Info6:42; Info9:8). It was also revealed during the interviews that there are two systems that exists such as the payment system and visitor’s statistics system which also provide some data that was needed for decision making. For instance, Info1 stated that, “...*we get their data when they pay for the park visit fees - here we have a payment system, but we just get little data...*” (Info1:10). Also, Info2 mentioned that “[*t]here is a system that has these statistics. So I can get them from the system*” (Info2:10).

Further interviews with tourism expert revealed that some historic data would be collected from experts database such as UNWTO database where as other data collection sources remained from internal database such as the budget tool, booking system, and the MNRT system (Info9:4,6,8) and the kind of data collected through internal systems contained some details of the visitor such as Nationality, age group, category- resident, non-resident, expatriate, or East Africans) (Info5:8; Info6:14; Info7:16; Info8:22; & Info9:8). In addition there are visitors surveys conducted in a certain period of time through survey monkey as revealed by Info8 and Info9:-

“...*there are surveys being conducted for establishing one safari which does not exist in Tanzania* (Info8:24),...*[i]n the past we use to do paper-based questionnaires but now there is survey monkey, google forms*” (Info8:16).

“...*we use data such as surveys -visitors surveys... (Info9:8), ...also at the ministry every year they do visitors exit survey*” (Info9:6)

Info9 added that, apart from the afore mentioned ways of collecting data they also do meet with stakeholders especially when they want to know customer satisfaction level:- “...*we also sit with stakeholders to hear their comments*” (Info9:14).

Data organization

The data collected has to be organized in order to make sense of them. Informants discussed ways in which they organize the data they collect through the means indicated above. The data would be organized from multiple sources, and this would be done by personal secretaries (Info1:14) and in other national parks this would be done by the officers themselves (Info2:17; Info4:14; Info3:14; Info6:44; Info8:28; Info9:10). The data obtained is grouped into categories and consolidated from multiple sources for the national parks that have multiple data collection points. Here is how they report on how they do the organization of this data: -

“...we group those data into two categories, we have some comments which congratulate what we are doing, and we have the data of the complaints for what did not do as was required” (Info4:14).

“I do read all data (comments, suggestions) and write a report on the good and bad ones...” (Info3:14).

There is a person responsible ... for collecting and compiling the emails and feedback or comments from the visitors...[by]...consult[ing] the book of comments and emails...and put them in a word document and print a report. (Info1:14).

Except from the afore mentioned, other data collected from the internal or external sources (systems and databases) were being organized by the respective systems as observed by the researcher and also confirmed by some respondents (Info7:20; Info8:24): - *“...for instance you need visitors data by nationality, or by activities such as walking safari or game drive so we just query in the system and get the data” (Info5:6).*

4.2 Information Level

Analysis

In order to make sense of the data, it has to be analyzed based on the context of its collection. In the data analysis stage, informants were asked on what they would need and what is missing to analyze data. The goal was to get some insights on whether they understood the data analysis process and what is required and also understanding if they did analyze the data what specifically did they notice that was missing. Info3 reported that *“...I do the normal analysis only seeing which data is useful and how to proceed with it...” (Info3:16)*, while Info4 indicated that he *“...would need some assistance (maybe staff) on analyzing the data because it is a lot of them that need to be looked so it takes time” (Info4:16).*

In the contrary Info2, Info5, Info7, Info8, Info9, and Info10 indicated that there is a system which analyses data (Info5:6; Info7:20; Info8:24; Info9:10; Info10:6) and that there is no need for him to do the analysis but rather print reports *“We have a system so there is no need of analyzing... like there is a database of visitors which we can just print a report... [w]e have a system when want to pull the statistics we take it from that system” (Info2:19).* Along with this, Info1 sees the need to have a software to do the analysis *“...we would need to have a good software like excel or a bigger system that can do that” (Info1:18).*

Subject to what is needed, Info2, Info1 and Info9 share the same views on what is missing indicated that there is a need for integration of the systems they have in order to capture data from multiple sources and for the system to yield analyzed results as he mentioned *“[w]hat I think is missing is the connection of our system to the one of immigration since we are dealing mostly with foreigners...[i] mean Fetching data directly from immigration...” (Info2:21) [and] “I can add that if we have a central analysis point...” (Info1:18) [and] “Also lack of integration like our systems are not linked with the immigration system...” (Info9:24).* Info3 and Info1 concurs on the need for an expert to do the analysis (Info3:18; Info1:18) while Info4 and Info7 sees everything to be good (Info4:18; Info7:26).

Summarization

Based on the analyzed data, informants were asked on how they would present the analysis. The target here was to capture the summarization practices. Results indicate that all analyzed data is being

summarized on monthly basis and put in a report that is printed and shared or presented during internal departmental and management meetings. Info1, Info2, Info3, Info4, Info6, Info8 and Info9 shared the same practice of printing summaries of their analysis into reports that are presented in their meetings for further actions (Info1:20; Info2:23; Info3:20; Info4:20; Info6:46; Info8:26; Info9:12)

4.3 Knowledge level

Synthesis

At this stage informants were asked whether accessing this processed data would improve their ability to act in their level, which intended to find out on how the processed data – information -knowledge is being used as a base for their decision-making practice. To understand how the synthesis takes place, use cases were used:-

Use case 1 (Planning and budgeting), Info1 confirms synthesizing on the information as he states “...we recall previous months report to make sure that all issues are attended, so getting access to this data is important. Also if we are doing planning and budgeting it is important to know what is existing and what needs attention so that we budget appropriately” (Info1:22)

“... the statistics help us on planning budget the annual budget, visitors’ projections for the next financial year, this is where these statistical data is helpful...we go through the statistics and can also see from other parks and compare with ours” (Info2:25)

Use case 2 (resolving a coalition), “...[i] can give you example of one scenario where we had a coalition in the bookings, some visitors came without any prior booking and the park was full, so when we consult our booking record, we did not see any booking from them, so we offered them what we had, and they were happy” (Info3:22)

Info4 only stated that the data is useful for them to meet the needs of the customers but did not mention how this is done “[t]hese customers are the one using our services and we align ourselves to their need, so it is very important to have this data in order to keep satisfying them” (Info4:22)

Use case 3 (Marketing and promotion), Info7 indicated that they use the nationality data for marketing (Info7:18). For instance, Info9 mentioned “...for you to know this is a potential market (growing, mature, or declining) you must obtain data ... [o]n number of visitations, we look at where do they go and how many or how do they spend. Yes, people travel, but where do they go and what do they do... that is what we look at” (Info9:4,6).

Use case 4 (Product introduction) “...for example if you want to add a picnic site they will ask you why, and you say maybe the number of visitors has increased, so you must show them the statistics” (Info6:48). Another incidence of product introduction was that of cable cars which Info8 mentioned that use surveys to inform that decision: - “...you cannot say that you want to start cable cars at a park while it is not feasible, that is why there are surveys being conducted for establishing one safari which does not exist in Tanzania” (Info8:10).

Prioritization

The information and knowledge must be prioritized to help in the best course of decision. Informants were asked on their opinion on the usefulness of this data (information and knowledge) for their daily decisions, the aim was to see if it is a priority in their daily decision-making practices.

Info4 mentions that the data further “...helps in improving the facilities or adding some new ones” and the bad comments “...are basis to improve our services” (Info4:24), while Info3 mentions in meetings and also believes that the information they obtained and helped them improve if further shared in the website would even help the customers in their travel preparation “I have explained to you and also if this park information is available on the website with all required data it helps the visitor to be prepared for the outdoor activities if its gears and equipment they need to have, prepare his/her budget before even coming to visit our park” (Info3:24)

On the contrary Info1 mentions that this data is useful “sometimes” as he stated “[t]he data is useful because sometimes you want to make decisions and you need to check something that is in the reports so you have to go to the files to consult it, so it is very useful otherwise it would not be kept in the files” (Info1:24). In addition, Info1 add that “...it is very useful if we have enough data even deciding things can be faster” (Info2:27)

Nonetheless, Info5, Info6 and Info8 mentioned elaborates how they find the data useful for their decisions such as facilities management, controlling tourism impact and for improving services and refocusing their attention where needed. This is what they Said: -

“It is very useful especially for facilities management and control, ensuring cleanness of the park, and roads networks within the park” (Info5:26)

“Yes, this will be helpful even to control the impact of visitors on the park” (Info6:34)

“...because you will know exactly what you need or how to improve where to focus, where to sell where to put more efforts and things like that” (Info8:30)

4.4 Implementation and Impact

This was the last stage where informants were asked on the implementation of their decisions what indicated that they worked. The goal was to capture the impact of their decisions based on the prioritized knowledge above, this implies that decisions have been made and implementation took place.

Both Info1 and Info2 confirms that they do routine checkups (monitoring) to see if everything is in order as they stated “[w]e usually check based on our routines and we see if there are changes...” (Info2:29), and “...we do routine checkups to ensure that everything is in order...” (Info1:26). On the other hand, Info3 and Info4 along with Info1 depends on the feedback from the customers on the improvements they made (Info3:26; Info4:26; Info1:26). For instance, Info4 states “[w]e receive emails saying congratulating us for improving the services” (Info4:26) and Info1 states “...we would not see the comments or feedback of the same issue again...” (Info1:26).

Contrary to other informants, Info2 approach is different as they do comparison check as he stated “...a good example is for number of tourists, if we do promotion, we see number rising in the statistics”(Info2:29), ...[m]ost of the times, what help us to measure is the bookings we get, so we sit and look this time promotion has brought how many bookings, sometimes during promotion you receive bookings on the spot (Info6:24) [also] If we go to china to do marketing, we will see Chinese number increase, if we go to America also the same” (Info7:22)

Nonetheless once incident that the system or technology was involved in impact assessment or monitoring was highlighted by info8 as quoted:- *“Auditors will audit the activities based on the revenue, this is done at the system directly (Info8:32) [also]...we have so many WhatsApp groups, now technology has simplified things social media apps are there and we get feedback (Facebook, Instagram and delegated email for customer care), we also sit with stakeholders to hear their comments” (Info9:14)*

4.5 Challenges of Data Use for Decision Making

Although not part of the conceptual model, respondents were asked on the challenges that will hinder the national parks to use data as decision making basis. The aim was to map the hindrances to the fully adoption of DDDMC in the national parks studied.

Both Info4 and Info1 mentioned “top level/management support” was crucial in implementing decisions based on data (Info4:28; Info1:28). For instance, Info1 mentions that *“[s]ometimes we have some good points, but the top leaders do not see it as a priority or important...” (Info1:28)*. In line with that, Info6 sees lack of funds control as a barrier to quick decision making as he mentioned: - *“[t]he biggest challenge here is we don’t have control of the funds any longer as it used to be in the past. So, everything is at the central government. If we want to do anything that require funds, it is a long process to get it done, and sometimes it can be postponed. The tourism business requires quick decisions, so this is a problem for us” (Info6:50)*

Lack of some key data such as complete customer profile, for instance some informants revealed that they would need to know their visitors interests in advance but there is no way in their system such data could be captured as Info6 mentioned and supported by Info7, and Info 8:- *“...it’s until they arrive at the park, although sometimes some visitors can call for booking and you ask them, so you get to know” (Info6:38; Info7:12; Info8:16)*. Also There is lack of data on activities done within the park by visitors as one Info6 stated: - *“[h]ere we communicate with patrol vehicles, there is no systems which has these data here. So, we depend on the patrol staff” (Info6:32)*

Lack of key personnel for data processing and direct communication with the IT personnel. Informants expressed their concerns on the difficulties in communication between the technical IT personnel and the general staff as Info7 mentioned: - *“I think it is communication between the system people and us (users), sometimes it is hard to make them understand what I want in the system for me this is a challenge” (Info7:34)*. In addition, findings revealed that there is lack of key data professionals as Info10 stated *“...we only have programmers and people of revenue who manage the revenues only and he is a programmer” (Info10:14)*

The existence of multiple systems which are not integrated was an issue which results into management problems and multiple errors on carrying out some tasks, *“[c]urrently we have so many systems because there were so many projects and each project ended up with a system which was outsourced... all these systems are not integrated and they are bombarded by network problems” (Info10:4)*

Both Info4 and Info1 mentioned “top level/management support” was crucial in implementing decisions based on data (Info4:28; Info1:28). For instance, Info1 mentions that *“[s]ometimes we have some good points, but the top leaders do not see it as a priority or important...” (Info1:28)*. Also, Info1 and Info2 agrees on technical challenges such as systems integration and network configuration issues (Info1:28; Info2:31). Info2 states that *“...the connection of our system with the one of immigration so I think that is a challenge for me. Because if they are connected it is easy for us to decide quickly on the category which we put this tourist” (Info2:31)*. In addition to that, Info3 sees the challenges of not having a centralized booking system can lead to data fragmentation (Info3:28). For instance, he shares a scenario to elaborate further: -

“[t]here are some scenarios like a visitor would come and have a good communication with the guide and they exchange emails and next time the visitor will book through the guide, this is not a good way as the guide will just surprise us with already confirmed booking which we are not prepared to accommodate” (Info3:28)

Info3 also highlights slightly on the prediction of events based on data as he mentions “

“[a]nother challenge is knowing in advance the visitors details and interests, as an expert I do not know ahead of time what my visitors would want to experience so this will be very difficult for me to sometimes decide on some activities and even as I mentioned the visitors need to prepare for activities that we have here and that have additional cost so we do not want to surprise them because that will be bad” (Info3:28)

Finally, Info4 mentions on technology that lacking necessary technology is a challenge *“[w]e also do not have necessary technology to improve our services to compete at the international level” (Info4:28)*

5 DISCUSSION

This chapter answers the research question formulated for this study by analyzing the theoretical framework and the empirical findings. The current decision-making culture is analyzed with reference to the adopted theoretical framework and its themes and ends with the analysis of the stumbling blocks of data use in decision making.

5.1 Current decision-making culture

A well-defined decision-making culture is central to the success of an organization. This study sought to understand the existing decision-making culture in tourism management in TANAPA. The empirical results indicates that most of the decisions in the tourism department are either based on established guidelines, experiences or some historic data and other factors such as availability of funds. For instance, one informant insisted that “...most of organization in the government are being led by guidelines...” (Info8:4). Although established guidelines are effective in management, they are not up to date and cannot accommodate emerging changes in the market such as that of the covid pandemic. The guidelines such as the General Management Plan (GMP) have for instance set out some activities based on low, medium, and high use zones but does not state how these activities should be established and on what basis. Further the annual reports stipulate only the status of implementations of the GMP but does not detail the how the implementation was carried out along with their basis. This implies that, business will still be carried based on knowledge and experience of the management since the decision-making culture is not well established on data. The tourism business is dynamic and requires real-time data from the market forces. Customer needs are ever changing, business models are evolving, and market competition is stiff, in order to gain competitive advantage, it is critical to have a decision-making culture which is well grounded in data. This can be achieved by having a data culture which will be a direct result of the vision for data use (Mandinach, 2012).

5.2 Data driven decision making

The theoretical framework presented four categories of data-driven decision making; data level, Information level, Knowledge level; and Implementation and Impact. This section will compare these findings to the empirical findings.

Data level

Data driven decision making requires data which must be available, collected through reliable sources and well organized in order to derive meaningful insights. Maxwell, Rotz and Garcia (2016) stated: - “[i]f data are not collected, organizations cannot analyze information to draw conclusions” (p.464) Throughout this study the researchers observed and examined how data is collected and how it is organized. Empirical results indicated that there are various sources of data such as through the reservation system, book of comments, word of mouth, surveys, email, and phone. Albeit the existence of such sources, there are data needs which are not captured. For instance, some informants indicated that they would need to know visitor’s interests in advance so that they can serve them better (Info2, Info3, & Info4), while Info5 would insist on knowing the visitors whereabouts while in the park, but such data is not captured anywhere from the available data sources. The data sources are not well organized to capture rich data, some are still traditional (paper based) and exists in silos and thus data collected loses its

strong base. This implies that, data cannot fully support decision making since it is fragmented. Taking advantage of technology for data collection such as the use of social media, company website, mobile applications, and enriching the reservation system to capture more details from the visitors would give TANAPA a competitive advantage.

Much as less data is collected, it is not properly organized. Empirical results shows that most of the data collected are just compiled into reports by normal staff. The implication is, this data may not reach the analysis stage and when used may lead to incorrect conclusions. Whoever is organizing the data is not the one analyzing which also may affect the usability of such data into analysis. Laying down means of organizing data through experienced data experts and specialized applications would give TANAPA advantage on data manipulation for decision making.

Information level

Through context, data can be grounded and transformed into information (Mandinach, 2012). In this study the context of improving customer satisfaction and marketing and promotion were used to examine the level at which data is analyzed or transformed into information. Empirical results indicated that only basic analysis is done at the department level and some analysis is done directly from online systems such as internal reservation system and survey monkey. This kind of analysis does not favor continuous drawing of insights from data as it is not a necessity. At some levels the data is further exported to external statistical package software such as excel and SPSS. This would lead to historical processed information or reports which are only for reporting. Since some informants mentioned the need for software to assist in data analysis and summarization, the use of advanced analytics software such as business intelligence software would help in key data analysis and visualization. The researchers observed the reservation system which is believed to analyze data but it lacks some technicalities of visualizing the processed information and at some point data has to be exported into spreadsheet for graphs drawing. To take advantage of available data the management could explore the possibilities of using advanced analytics software that will for instance analyze all the parks data and visualize in real time monitoring such information like number of visitors and activities they embark on in the park.

Knowledge level

The knowledge level is crucial since the final conclusions or actual decisions are made at this level. Having established a good data basis provides the desired confidence for decision making. Findings indicated that there are some decisions which are based on data and the level at which this data is synthesized and prioritized depends on some situations. Since there is a mixed culture of decision making it is difficult for data to be a priority, other factors such as availability of funds will always be prioritized. The dearth of data analytics tools and adequate required skilled personnel such as data analyst or data scientist pose a threat to DDDM culture as no supportive information to be synthesized and prioritized at the knowledge level. The national park could strengthen the analytics level which will yield a strong support at knowledge level where most of the final decisions are made.

Implementation and Impact

The knowledge processed at knowledge level is used to make decision which has to be implemented as well as its impact examined. Empirical results indicated that, the little knowledge generated by the data processed is used to make decisions which are monitored, for instance routine checkup and visitors' statistics (Info1; Info2; Info3; Info4; Info6; & Info7). Researchers found this to be basic routine and monitoring of the impact of the decisions. Total dependence on members for report on real time activities should be replaced with infrastructure or tech that can use data and provide a real-time report (based on live data) of an ongoing events or activities. This will provide more insights into the data and therefore build more confidence on data use (DDDM culture). As argued by Mandinach (2012) that DDDM is an

iterative process and not a linear one, building on real-time reports (tech enabled) will determine if the managers have to return to any part of the DDDM cycle to be more productive and DDDM savvy.

5.3 Challenges of data use for decision making

The use of data for decision making requires certain conditions to be met before it can fully become an organization norm. Our study revealed that there are stumbling blocks which prevent the spread of DDDM culture at TANAPA. For instance, the top level management has not fully supported the dependency on data for decision making (Info1 & Info4). Jia, Hall and Song (2015) argues that Data-driven decision making should be prioritized by top management in their business operations. At TANAPA if DDDM is not a necessary component of the organization, implementers (tourism officers at park level) may disregard data they collect, and this may impact the quality of the data. The use of data for decision making should be envisaged in the TANAPA vision which will allow officers at all levels to play part in data recruitment and effectively use it for their decisions.

Mandinach (2012) argues that the lack of human resources surrounding DDDM is a problem that has a greater effect on practice than on research. Based on empirical results it was clear that there are no data experts at the tourism department. Data organization and analysis is made as the responsibility of the tourism officers regardless of their data proficiency or literacy and as a result data does not receive in-depth analysis. This deprives data value that TANAPA would be getting by engaging data professionals. In order to find value in the data and to make it as a necessity in the management, at each department data scientists could be hired and engaged in mapping the data use process (collection to synthesis).

Executives in all industries are using technologies such as analytics, mobility, AI to change customer experience, internal processes, and value propositions (Westerman, Bonnet & McAfee, 2014b). Researchers observed that TANAPA has engaged the use of technology such as the use of reservation and budget systems which aids in data collection as well as processing. In our observations it was clear that this was part of the internal process change which has not fully transformed the customer experience. Arguably Westerman, Bonnet and McAfee (2014) claims that the main aim in the use of technology should be to drive change in customer experience, operations, business models and digital platforms better than others. This implies that technology application at TANAPA could embrace a broader vision than only the internal process and since the empirical results revealed the absence of digital strategy, this could be made a priority in line with the use of technology.

6 PROPOSED FRAMEWORK

The previous chapter answered part of the research question which was to understand the decision-making culture of TANAPA together with the existing gaps for becoming fully DDDM organization. This chapter synthesizes the identified gaps into a framework for achieving DDDM culture in tourism management at TANAPA. By adapting Mandinach (2012) framework, we propose a DDDMC framework (Figure 7) composed of organization, culture of data use, leadership capability, and digital capability, “based on a process-based augmentation approach driven by a vision” (Bagheri, & Hjorth, 2007, p.85) of conceptualizing data-driven decision-making culture.

Data-Driven Decision-Making Culture

In concurrence with other scholars (Mandinach, 2012; Maxwell, Rotz & Garcia, 2016; Preskill & Boyle, 2008) DDDM culture in this proposed framework refers to the practice of an organization in utilizing data, information, and knowledge assets in a series of coordinated decision making processes in order to support, inform, or make decisions. The study’s results indicated that there is no clear established basis for decision making, while other managers would use experiences, others used some data along with existing guides, rules, and regulations. According to Westerman, Bonnet & McAfee (2014) without strategic investments in the proper digital technology and leadership capabilities, digital transformation is impossible. TANAPA top leadership must create a digital transformation plan that can be successfully implemented and expanded throughout the organisation (Booth, Mohr, & Peters, 2016). Since, increased service efficiencies have resulted from digitalisation (Tiwari, 2016; Semdino, 2013), proposed DDDMC framework will allow for improvements in value chain monitoring, transparency, connection between organizations and consumers, data collection to improve consumer understanding, and waste reduction. Furthermore, they should embrace the combination of culture, people, structure and tasks with each other — termed digital conformity, corporate strategy, and the difficulties of a continuously evolving digital world in order to manage the complexities of digital process (Kane, et al., n.d.). Therefore, attaining a DDDM culture would require a combination of leadership capabilities and digital capabilities which will set a foundation for the culture of data use for decision making. As depicted from figure 7 DDDM culture is dependent on leadership capabilities and digital capabilities as further explained in the later stages. According to Kane, et al., (n.d.), digital capability may ensure that an organization's cultural mindsets prioritize innovation and speed, accept risk, and build distributed leadership structures that enable cooperation among all members while also encouraging data-driven decision-making.

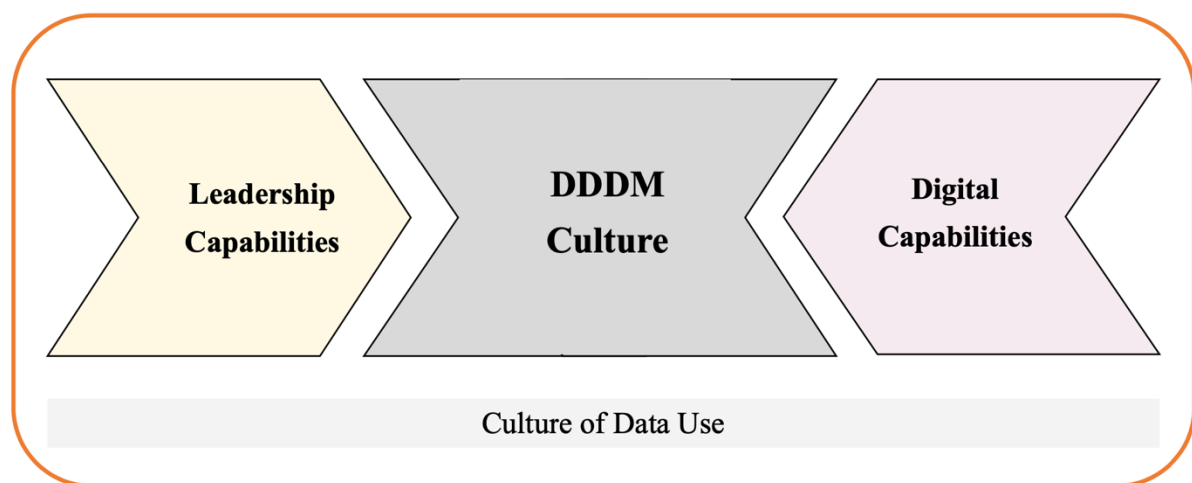


Figure 7: Proposed DDDMC Framework

Leadership Capability

Westerman, Bonnet and McAfee (2014a) research reveals that managers in every Digital Master have driven the transition through clear top-down and bottom-up leadership: setting course, creating momentum, and ensuring that the business moves forward. The empirical findings identified a gap between the top leadership and lower-level staff. It was clear that most of the implementing staff category did not know the vision nor the mission objectives while carrying out their decisions irrespective of the established guidelines. Further some complained of lack on support from the top leaders whenever data-based proposals were brought forward. In the proposed DDMC framework, top managers (top level management) could first establish a clear data culture vision which emphasizes on the use of data at all levels of decisions, and the vision must come from the top. This in turn will lay a strong foundation of data recruitment by establishing data collection and processing infrastructure.

Suggested by Westerman, Bonnet and McAfee (2014a) in building up leadership capabilities, staff engagement is vital, that is breaking the silos and introduce sharing of information across the organization. It is critical to prepare national park personnel for change, before adopting and beginning a new development process to overcome problems linked to change resistance (Davenport & Harris, 2007). At TANAPA, breaking silos and embarking on new procedures, active engagement and excellent communication are critical for creating acceptability among the organization's members (Vodenčarević & Fett, 2015). The empirical data confirmed this, indicating that active engagement made staffs feel included and heard during the transition and transformation. According to Vroom (2003) for effective decision-making process, it is vitally important to ensure participation of key stakeholders likewise for the decision acceptability, the clarity and comprehensibility of a decision support system should be addressed (Gregor & Benbasat, 1999).

Along with breaking silos, Westerman, Bonnet and McAfee (2014a) suggests that it is critical to build up a strong IT business relationship with the IT department. Empirical results indicated that there is some collaboration with the IT personnel but at little percentage. The relationship only existed at the maintenance level rather than at the development level. In the framework we propose that a strong platform could be built which will support the collaboration across departments and that will let decision makers know what is always happening. This will include integration and collaboration with stakeholders in the tourism business – visitors, tour guides, tour operators, and the government ministry. For example, decision to diversify a product or create a new activity in the park should involve all stakeholders at all levels and born in the basis of current data.

In another perspective, to make the best decision, TANAPA leaders, must make available all essential information or data (Schuh et al., 2020) and the desire of the national park board to adopt data-driven decision making, which will promote data governance (Kumar et al., 2013). According to Buhl, Roglinger, Moser, & Heidemann, (2013), technologies and business model cannot be standalone variables in organizations' data driven decision-making practice without defined data governance in form of rules or guidelines for data quality, data responsibilities and data management procedures. Therefore, the leaders should have a mindset of being in command of their own approach, constantly pushing to learn more and producing or seeking knowledge that will aid the process of effectively use of data all the way (Earl & Katz, 2002). Schuh et al., (2020) explained that organizations' members would have greater knowledge about the actual situations if leaders adopted decentralized decision-making mechanism because staff members are closer to the facts, especially in the case of TANAPA national park.

Consequently, as some staff members of the national park matures, culture will then begin to limit, stabilize, offer structure and purpose to rest of the members, even to the point it will eventually determine what type of leadership will be acceptable in the future (Schein, 2010). Like in the case of the head of tourism department (park level) who are seemed to be well connected with park staffs and they are

cordially related with information dissemination. This is evidently observed as all other levels of leadership within the TANAPA national park had less effect on park staff members views of culture than immediate leader (Block, 2003). Thus, McGuire & Rhodes (2009), interpreted this to mean that top leaders' responsibilities in terms of inter-relationship needs to change as well, and TANAPA leaders must become a key object of change, taking on the necessary difficulties in order to steer the national park towards a challenging future. The study further concluded that this is a new call to action, therefore, TANAPA management board must ensure a new leadership identity that will not only enhance leadership abilities but also shift their mindsets from one level to another.

Digital Capability

Digital capability refers to the ability to utilize technology to improve customer experience, operations, business models, and digital platforms better than others, rather than merely performing analytics, mobile, or Artificial Intelligence better. Internal operations should be well integrated to allow data sharing across all internal departments and external stakeholders. For instance, the reservation system should be integrated with the immigration system where visitor's visa status and demographic details could be easily obtained. This was confirmed by some respondents who suggested that TANAPA systems should be integrated with immigration to avoid frauds and data duplicates. According to Westerman, Bonnet and McAfee (2014b) executives in other industries are using these technologies (analytics, mobility, AI) to change customer relationships internal processes and value propositions. Empirical results shows that there is no established digital platform through which operations and customer experience could be transformed. At some point tourism officers vividly revealed that they had no in-depth knowledge of their customers. In line with the strategic objectives laid in the leadership capability section, a digital platform could be established by TANAPA which will allow data harvesting for customer understanding, digitalization of processes and operations, worker enablement as well as performance management. Improving customer experience involves knowing what the customer needs, the data structure should capture all the necessary details which are currently missing such as the visitors interests along with their complaints. This in turn will support the established data culture and provide it with the necessary infrastructure for decision making. Services could be born and built at the heart of customer experiences rather than on guidelines and procedures as is the current practice. This will allow TANAPA to focus on operational areas that require improvement, and mostly areas at which customers are dissatisfied.

According to Lie et al., (2020) the digital capacity to dynamically combine organization resources with digital tools or systems is referred to as digital capabilities. The tourism department could revisit their data platform, redesign collection techniques, and employ analytics technologies to extract value from the data and therefore derive insights. It was evident that there were no advanced analytics systems or software to derive value from the existing data, only basic analysis was done. The framework proposes that building a digital capacity should involve recruitment of analytics software such as business intelligence software (power BI or Qlik sense) along with recruiting knowledgeable data scientists. As pointed out by Davenport & Harris (2007), digital capabilities will be made of a several of activities implanted in the organization to emphasize the value of information, through a process of gathering, storing, and analyzing digital data. The management capability of the information should be in terms of "providing users with the necessary degrees of data accuracy, timeliness, dependability, security, confidentiality, integration, and access, as well as the flexibility to adjust these to changing organization wants and implementations" (Mithas, Ramasubbu, & Sambamurthy, 2011, p.238).

To digitalize its, service, or operational functions, the organization must integrate new digital solutions such as system software and hardware, which uses technology to identify what is trending among target customers and allows organization to tailor their product offerings accordingly (Khin & Ho, 2020). Regardless of how well technology is implemented within an organization, its utilization and

administrations should be overseen appropriately and effectively (Lu & Ramamurthy, 2011). In-line with this thought, management must also examine how new technologies will support these flexible capabilities by accelerating training and skill learning through intuitive and augmented reality solutions that securely lead personnel through the new operational development (Schuh, Anderl, Dumitrescu, Krüger, & ten Hompel, 2020). Empirical findings indicated the need for a clear description of strategic objectives of data-driven decision making and a gradual development approach towards these objectives to solve difficulties linked to funding or costs of new investments required. Meaning that executives or board of management must ensure that implementation of new technology must comply with the organization's strategic objectives for achieving data driven decision making practice. Also, to incorporated as suggested by empirical results is the need for mutual collaboration within all stakeholders to define and accept technology needs.

Culture of data use

The culture of data use is an essential enabler of the DDDM culture especially in the proposed components of digital capability and leadership capability. Today's senior leaders live in a more complicated and dynamic new world order, requiring TANAPA leaders individually and collectively to acquire bigger frame of mind – new mind-sets that can predict and equip companies to ensure needed adequate capabilities to confront consecutive future problems (McGuire & Rhodes, 2009). Empirical findings confirms that the culture of data use has not fully dissolved in the tourism department even though the tourism business involves connected customers who generate large volumes of data. Diffusing the culture of data use into the framework could mean change of the current norms to inculcate habit of a “culture of inquiry” as suggested by Earl & Katz, (2002) which: -

- Involves others in interpreting and engaging with data
Leaders should help foster an inquiry culture by offering chances for people to become inquiry-minded and data-literate. This entails supporting, investing, and educating staff members to interact with and adopt practice of data use.
- Stimulates an internal sense of “urgency”
Data may be an effective tool for refocusing the agenda or recasting the problem. As a result, data becomes the window for determining "what next" and infusing "urgency" as a means of creating energy connected with a plan of action that makes sense in accomplishing the objective of education.
- Making time
It takes time to make sense of data and use it to develop collective meanings and commitments. Therefore, leaders and every member who works with data will require a significant amount of time to examine the main issues, identify what data is relevant and assure availability, as well as consider the data and try to make sense of it while also gathering additional information.
- Using “critical friends”
The concept of critical friends is quite potent. According to Costa & Kallick, (1993) critical friends as a friend is, “a trustworthy person who makes stimulating inquiries and asks interesting questions, provides data and facts to be viewed through a different lens, and provides critique of member's work” (p.50) and assist in reformulating interpretations, and highlight what has already been done (Sutherland, 2004).

This study does not give a complete definition of the skills required by leaders to utilize data wisely and effectively in their job. Rather, we attempted to make a case for leaders to establish the data culture and be the major makers, consumers, and users of data for decision-making and planning improvement efforts. We have recommended leaders to think about not only what they need to know, but also why they need to know it and how they might make the most of data (Earl & Katz, 2002).

7 Conclusion & Future Research

This study aimed at answering the research question: - "How can Tanzanian National Parks build a data driven decision making (DDDM) culture for tourism management" which was answered in two stages, one was to first understand the existing decision-making culture which laid a foundation for stage two on the proposed framework for building a DDDM culture at Tanzania National Parks. Our findings show that the park administration makes most of its decisions based on established rules when implementing plans, addressing most reported obstacles, and not using a data-driven management method. Most of the operational issues that arose might have been avoided or mitigated if adequate data-driven decision-making culture and digital strategies had been implemented. Furthermore, the need for national park management to increase their data consumption to utilize change management approaches as a guidance is vitally important. Rather than relying on the leader's instincts to operate the park's services and operations.

The implications and contribution laid out in the above sections are constrained by the thesis's study goal, literature background, and research methodologies (Robey, 1996). The importance of our study is that it provides a first look at the existing decision making culture in the context of tourism management (a case study of Tanzania national park) and their level of data use. To develop strategy and policies that will be driven by data for both technical and non-technical activities on both the internal processes and external environment levels, an efficient roadmap for scaling up data utilization should be established. Nonetheless, technological requirements observed cannot be overlooked, there is a need for restructuring data systems to allow more collection of data, in-depth analysis and visualizations of current activities at all parks where TANAPA has data ready for processing visualizations such as the visitors statistics which are populating every minute. In addition, this goes along with recruitment of technical staff such as data scientists at the park and headquarters level.

Further study on what measures tourist management takes in practice to build up the use of data-driven culture is encouraged. Further study is required to test the effectiveness of DDDM culture framework in tourism management at the national park and its impact on visitors' satisfaction. There is a need for action research to further implement the framework and assess its impact on tourism activities along with other areas of park resources management.

8 Appendix 1: First Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National Park, and the roles and responsibilities you had	-
2.	Info1	I have been working for the National Park for almost 10 years up to this moment as senior tourism officer and also recently as a northern zone manager dealing with tourism activities at national park A. My working responsibilities as a senior tourism officer actually we are dealing with Promotion activities, announcing the park, Marketing attractions of the national parks, we are doing also research concerning tourism issues. I also deal with facilities development, planning and budgeting and conducting impact assessments of tourism activities on the communities and the park in general	-
3.	Researcher	What types of decisions do you make on your daily work?	
4.	Info1	Decisions i make are for instance when we do the promotions or marketing i have to decide when and how am i going to market the park attractions, we have a lot of attractions like the (**) waterfalls, the unique species such as plant species that are used for local medicine; for facilities I have to decide what needs to be replaced or renovated; another issue is for tourism issues like when we have complaints or suggestions from visitors I make decisions on how to work on the feedback; i have also to decide on the budget implementation and plan for what to include in the next budgeting or planning, so there are so many things happening that require me to make decisions	
5.	Researcher	For instance, you want to promote the waterfall or any other attractions of the park, since these are resources which are always there, how do you know now that you need to promote?	
6.	Info1	Okay, actually you are true they have been there, today we are going to promote the waterfalls according to fund, the fund leading us to promote and actually we prefer to promote on high season starting on December that is the time to promote and that Is the time we get funds from headquarters.	Cul-non
7.	Researcher	In making such decisions, what do you base on? do you have a baseline for making such decisions	
8.	Info1	Basically, for promotion we take these as are our daily activities, they are in line of duty, so we have to promote if we have funds as I said and when we have opportunity to go for the trade fairs, we also promote them there. So the kind of promotions or marketing we do is the general one that we know by experience what is always needed.	Cul-non
9.	Researcher	If you can take decisions to improve the (tourists' experience/number of tourist visits) what data/information would you like to have?	
10.	Info1	There are specific data I would need, what I need first is the data of the tourist (like where they are coming from -USA, Europe, Asia, or Australia), also their cultural background, I would need to know their interests like what they like to see in our national park	Dat-col

11.	Researcher	If you know their interests, how do you use those interests?	
12.	Info1	We are always asking their interest because they differ, and the cultures where they are from are differ, so we always ask the clients their interests so that we can make them happy according to their interests.	Dat-col Kmw-impl
13.	Researcher	How would you collect this data? When and where?	
14.	Info1	Usually, we collect this data when the clients arrive at our park, we give them introduction of the park-orientation and always ask them what their interests is.	Dat-col
15.	Researcher	Do you have any alternative of getting their interest apart from them being at the park?	
16.	Info1	No before they come we cannot know actually, so we are always waiting for them to come at the park.	Chall
17.	Researcher	So what other ways do you collect this data?	
18.	Info1	We prepare a number of activities for them, varieties which we think might fit all the visitors, example bonfire, volleyball, music from the local people here (Ngomas), dramas, barbeque etc. so obvious visitors will like any of these activities and then we can discuss during the evening where they will also tell us during these events and activities what they liked or enjoyed. Because we have comments, book of comments which they can tell us, and we take the comments to increase the activities or improve them. Also, we get their data when they pay for the park visit fees -here we have a payment system, but we just get little data, and some data we get from tour operators when they book for campsites.	Cul-non Dat-col
19.	Researcher	If you want to increase the number of activities what tells you that you have to do so?	
20.	Info1	When you want to increase activities, you ask the clients and we give them the book of comments that you get the information of what they need, so when they write the comment, we get to see what the interest of another is.	Dat-col
21.	Researcher	How would you get feedback from tourists?	
22.	Info1	When we want to get feedback, we always have a book of comments as I mentioned earlier where they can comment maybe next time do this or that, so we ask them to write their comments if they also liked the activities or enjoyed the visit or for those visitors who have complaints maybe they are not satisfied with the services they can tell us. For example, one visitor complained about the facilities condition there were some missing items in the camping tent and we make some adjustments like that. We also get to know the interests based on their cultures like Americans like this or Europeans like this or that. Another way is by email, we give them the email of the park and they can write to us, there is a park telephone number, we also have a permanent WhatsApp number and other social media like Instagram, Facebook where they can comment on what we post there.	Dat-col Kmw-impl Kmw-impl
23.	Researcher	How would you organize/consolidate the data collected?	
24.	Info1	We have a specific person responsible (always a personal secretary or the tourism officer) for collecting and compiling the emails and feedback or comments from the visitors and type them in a word document, print a report and present it to the head of department and then we will discuss in the management. So, this person	Dat-org Inf-sum

		will always consult the book of comments and emails and type all of them in a report	
25.	Researcher	Are there times when you go through the past files or reports in your meetings?	
26.	Info1	Every month we write a report, and we compare the report of this month and the same month of the last year	Knw-syn
27.	Researcher	What would you need to analyze the data once it is collected?	
28.	Info1	Maybe we would need to have a good software like excel or a bigger system that can do that	Chall
29.	Researcher	How do you analyze the data you collected?	
30.	Info1	We are going to deal with that information, see what is needed to be done, we do this at the level of department then we take it to the management. Not all information we work with, so we only work with the data which we think it will help us and that which is not we just leave it.	Cul-non Inf-sum
31.	Researcher	What is missing to analyze the data you collect today?	
32.	Info1	I would say maybe the expert to do the analysis, because the data we get is just compiled in one report and waiting for discussion in the meeting. Also, in the meeting we try to see if there is anything that require attention but discussing the report in detail, we expect the one presenting to present the issues based on his assessment. I can add that if we have a central analysis point it would help also to save time during meetings	Chall Inf-sum Knw-syn
33.	Researcher	How would you present the data once it is analyzed?	
34.	Info1	This data is presented in hard copy report that is discussed during department and management meetings; each officer would present what he compiled and analyses, for the whole months and we try to see the issues that have been said by many officers in their reports and we can tell this requires attention, or we also get some good inputs from their presentation.	Inf-sum
35.	Researcher	Would accessing this data, improve your ability to act at your level?	
36.	Info1	Yes, because every month we prepare reports and we recall previous months reports to make sure that all issues are attended, so getting access to this data is important. Also, if we are doing planning and budgeting it is important to know what is existing and what needs attention so that we budget appropriately	Knw-syn Knw-impl Knw-pri
37.	Researcher	What is your opinion on the usefulness of this data for your daily decisions?	
38.	Info1	The data is useful because sometimes you want to make decisions and you need to check something that is in the reports so you have to go to the files to consult it, so it is very useful otherwise it would not be kept in the files	Knw-syn Knw-impl
39.	Researcher	Do you think for instance the feedback data/information from the visitors is enough for decision to improve their experience?	
40.	Info1	No, it only adds value but we as a tourism department we sit and think what to do to make visitors satisfied. Other members propose what they think on what exactly to do to improve, in the department we are more than 15 so we share ideas on what each other think and then come into a conclusion.	Cul-non
41.	Researcher	Once you implement your decisions (based on data), how would you know they work?	

42.	Info 1	First, we do routine checkups to ensure that everything is in order and also, we would not see the comments or feedback of the same issue again example it was complaint the if we solve it, we know there will be no complain. If someone complained of the facilities, we make improvement or sometime fix a person in the particular place to make sure that everything is in place. We also send a feedback to the visitor that we worked on your comment.	Knw-impl Knw-impl
43.	Researcher	What would be the stumble blocks/challenges in the organization to decide based on data?	
44.	Info 1	One is top level support. Sometimes we have some good points/information, but the top leaders do not see it as a priority or important so they delay the decisions or do not work on our proposal and sometimes they can tell you we do not have funding. And another i would say generally is network problem (I mean Wi-Fi, you can stay the whole month no network) during the data collection that are online. Sometimes the network is so down even if a visitor wants to write a comment online it becomes a challenge	Chall

9 Appendix 2: Second Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National Park, and the roles and responsibilities you had	-
2.	Info2	This is my second year working for national park B, and I was employed as Tourism Promotion assistant, but that was before the system changed, so now my title is conservation ranger – tourism. My duties I work in tourism department are; receiving and attending tourists, guiding tourist to the attractions, providing interpretation and information to visitors who visit the park including the different groups -schools, universities and other international visitor groups, I do collect and analyze and prepare daily statistics of visitors who visit the parks, another duty I join with other staff to prepare monthly & quarterly reports of park visitors, another duty is normal duty supervise and maintain tourism facilities and their general cleanness in the park.	-
3.	Researcher	What types of decisions do you make on your daily work?	
4.	Info2	I make decisions where to guide the tourists, which activities to prepare for tourists and what information to give them, what to include in reports the quarterly and monthly ones and also for the facilities that needs to be replaced or repaired I present to my head of department.	Knw-impl Inf-sum Knw-imp
5.	Researcher	In making such decisions, what do you base on? do you have a baseline for making such decisions	
6.	Info2	I have decent guiding skills, and I acquired my skills based on the kind of tourists because some of them do not like more explanation more interpretation, so I have to see what they are interested and guide them according to the way they prefer. So, I have good skills for making them satisfied.	Cul-non
7.	Researcher	So this is based on your skills and experience?	
8.	Info2	Yes of course, I get the skills from the college from where I trained	Cul-non
9.	Researcher	If you can take decisions to improve the (tourists experience) what data/information would you like to have?	
10.	Info2	I need to know the number of tourists visit my park and where they come from. I need to know if they are residents or non-residents (this is for charging them the fees), also what is their interests in my national park.	Dat-col
11.	Researcher	How would you collect this data? When and where?	
12.	Info2	There is a system that has these statistics. So, I can get them from the system.	Dat-col
13.	Researcher	Since you mentioned that you have the system, specifically what data does the system capture?	
14.	Info2	Okay, we capture a lot of data, maybe those visitors from different nationality from different national we identify how many Americans maybe people from France or Norway or South Africa visited the park, we see the expatriate, we see how	Dat-org

		many residents or non-residents, the system has a different setup it identifies also the adults or children and also whether they have a valid permit I mean working permit or resident permit or not. Because these have different prices for the park entry.	
15.	Researcher	What about their interests, are they also in the system?	
16.	Info2	No, the system has the nationality and number of tourists, so their interests I get when I talk to them because I am the one to introduce them when they come to the park so I ask them.	Chall Dat-col
17.	Researcher	How would you get feedback from tourists?	
18.	Info2	As a park we have a visitor comment book, so visitors before they leave the fill in the suggestions and comment based on their tour. We also get feedback also through social network because we have Instagram page and some tourist comment through the page that they have enjoyed the trip. We do not always get good feedback but sometimes we also get bad one	Dat-col
19.	Researcher	How would you organize/consolidate the data collected?	
20.	Info2	We compile them and put in our work progress so as to fix those problems. We do together as a department especially when we write monthly report, and we see what challenges we faced in this month, and we see what we shall do to solve or work on them.	Dat-org Inf-sum
21.	Researcher	Who is responsible for compiling this data? Who goes to the social media to compile the data	
22.	Info2	I am the person responsible for that task and I am the operator of the social media page, I am operating the B national park Instagram page and when I gather anything I share with my staff and my heads of department and other staff then we put it in the report.	Dat-org Inf-sum
23.	Researcher	What would you need to analyze the data once it is collected?	
24.	Info2	We have a (***) system so there is no need of analyzing the systems captures everything (nationalities data, expatriate, residents or non-residents) like there is a database of visitors which we can just print a report. We have a system when want to pull the statistics we take it from that system, If we want to check the visitor for the last month of the whole national park or your national park, so if you want you just print it. The system has different setup for capturing data.	Chall Inf-anl Dat-col
25.	Researcher	What is missing to analyze the data you collect today?	
26.	Info2	What I think is missing is the connection of our system to the one of immigration since we are dealing mostly with foreigners. Like for example if those visitors come, and we enter their passport number then we get everything and we reduce the number of questions and waiting time for the visitor. I mean Fetching data directly from immigration, because when they come, we ask them to provide a lot of information and they fill in a lot of paperwork.	Chall
27.	Researcher	How would you present the data once it is analyzed?	
28.	Info2	Of course, I share with my head of department through printed reports and discussion, and we agree what to put in our monthly report.	Inf-sum Chall

29.	Researcher	Would accessing this data, improve your ability to act at your level?	
30.	Info2	That is a nice question, the statistics help us on planning budget the annual budget, they try to see what visitors' projections for the next financial year are then they see maybe we project 100 visitors, this is where these statistical data is helpful (they can see if its decreasing -then we see what we can do to increase the visitors maybe do promotion). When we sit in the meeting we go through the statistics and can also see from other parks and compare with ours.	Knw-impl Knw-implt Knw-syn Knw-pri
31.	Researcher	What is your opinion on the usefulness of this data for your daily decisions?	
32.	Info2	I think it is very useful if we have enough data even deciding things can be faster.	Chall
33.	Researcher	Once you implement your decisions (based on data), how would you know they work?	
34.	Info2	We usually check based on our routines and we see if there are changes, a good example is for number of tourists, if we do promotion, we see number rising in the statistics.	Knw-implt Cul-non Knw-impl
35.	Researcher	What would be the stumble blocks/challenges in the organization to decide based on data?	
36.	Info2	I mentioned the connection of our system with the one of immigration, so I think that is a challenge for me. Because if they are connected it is easy for us to decide quickly on the category which we put this tourist	Chall

10 Appendix 3: Third Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National park, and the roles and responsibilities you had	-
2.	Info3	Yeah, I worked for national park C for more than eight (8) years now, and I started as a conservation ranger and currently am senior conservation ranger -tourism. I manage the conservation and tourism activities in the park such as guiding visitors, promoting the park unique attractions, managing tourism information center, managing the visitors booking and also make plans and budgets for the park.	Knw-impl
3.	Researcher	What types of decisions do you make on your daily work?	
4.	Info3	Well in my daily work there is a lot involved, tourism activities we prepare for tourists needs decision like which activities should we have in a day and which one to hold on. I also have to see how many visitors the park can accommodate by bookings available, even budgeting it requires decisions, so these are examples of many other decisions.	Knw-impl
5.	Researcher	In making such decisions, what do you base on? do you have a baseline for making such decisions	
6.	Info3	Well if we talk of tourism activities, these depend on the interests of the visitors because we have a range of activities that we believe visitors will like. When they arrive we usually gather in the meeting in evenings welcome them and we exchange experiences and we get to know their interests, so it is through those interests that we decide on the guide activities for the next day. I also use the booking book for visitors arrangement and management, example allocation to the halls or tents or guest rooms. Again based on my experience there are some decisions I will use my skills and experience to decide on the right one.	Cul-non Dat-col
7.	Researcher	If you can take decisions to improve the (tourists experience) what data/information would you like to have?	
8.	Info3	I would like to have some information or data in advance such as those of booking. It will be good to manage the visitors and prepare a number of events and activities that we know will make our guests happy when they visit our national park. I like to have data on facilities that have to be renovated or to be changed	Chall Dat-col
9.	Researcher	How would you collect this data? When and where?	
10.	Info3	Right now we have a WhatsApp group, a telephone number, office email and a booking book/register. So visitors come to the park and they book and if we have some available space they can move in or if not we tell them to come on another day which is free. But for those who send email, messages or call for booking, at least we can respond to them while they are where they are so they do not have to waste time coming to the park and find its full.	Dat-col Knw-impl
11.	Researcher	How would you get feedback from tourists?	

12.	Info3	We have visitors comment book and sometimes the visitors tell us themselves on their experiences with the guide, facilities or the activities we prepare for them	Dat-col
13.	Researcher	How would you organize/consolidate the data collected?	
14.	Info3	I do read all data (comments, suggestions) and write a report on the good and bad ones so that when we have a meeting I can share with other staff in meeting.	Dat-org Inf-sum
15.	Researcher	What would you need to analyze the data once it is collected?	
16.	Info3	Here I do the normal analysis only seeing which data is useful and how to proceed with it further	Cul-dat Inf-anl
17.	Researcher	What is missing to analyze the data you collect today?	
18.	Info3	I would say maybe time and expertise if I want to do the detailed analysis of the data or information I have	Chall
19.	Researcher	How would you present the data once it is analyzed?	
20.	Info3	As I said we normally have regular monthly meetings which we discuss all reports and issues that came up within that month. So my staff and I would print their reports and present them and we discuss.	Inf-sum
21.	Researcher	Would accessing this data, improve your ability to act at your level?	
22.	Info3	Yes. There are useful information that is discussed in the meeting which some came from the reports and help us to make good decision. I can give you example of one scenario where we had a coalition in the bookings, some visitors came without any prior booking and the park was full, so when we consult our booking record we did not see any booking from them so we offered them what we had and they were happy.	Knw-syn
23.	Researcher	What is your opinion on the usefulness of this data for your daily decisions?	
24.	Info3	You see first it help us in meeting as I have explained to you and also if this park information is available on the website with all required data it helps the visitor to be prepared for the outdoor activities if its gears and equipment they need to have, prepare his/her budget before even coming to visit our park. In past visitors when they come to park we tell them the activities and they would complain like "I did not know" or "I do not have budget for that" or "I wish I knew earlier" so if there is this data on website at least they will be prepared before.	Knw-impl Knw-pri Knw-syn
25.	Researcher	Once you implement your decisions (based on data), how would you know they work?	
26.	Info3	Of course, there will be no complaints or coalitions like the ones happened earlier, if bookings are managed well then we have good preparation of the visitors and that will mean no complains later.	Cul-non
27.	Researcher	What would be the stumble blocks/challenges in the organization to decide based on data?	
28.	Info3	One of challenges I see is not having a centralized booking system since booking can be done in those ways I mentioned it is difficult to have one data. There are some scenarios like a visitor would come and have a good communication with the guide and they exchange emails and next time the visitor will book through the guide, this is not a good way as the guide will just surprise	Chall

		<p>us with already confirmed booking which we are not prepared to accommodate. Also when the booking is centralized at least one booking can easily be notified at all our booking points rather than scattered one, that is just one example.</p> <p>Another challenge is knowing in advance the visitors' details and interests, as an expert I do not know ahead of time what my visitors would want to experience so this will be very difficult for me to sometimes decide on some activities and even as I mentioned the visitors need to prepare for activities that we have here and that have additional cost so we do not want to surprise them because that will be bad. Maybe I can add that our park or the central website lack information of what we have like advertisement of our attractions so it becomes difficult even when orienting visitors in the first day, most of them will tell you ooh I did not know that. So that is what I can say for now.</p>	
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11 Appendix 4: Fourth Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National park, and the roles and responsibilities you had	-
2.	Info4	Now it is 8 years since I started working for the national park D and currently am senior tourism promotion officer – (senior conservation officer -tourism). My roles here are; to supervise all activities concerning tourism for example the main entrance gate (do all registrations and payments) in and out movements, supervise all services to the visitors who visit the park -accommodation & campsites make sure all services are available without problem, I supervise booking section -all communication between the park and visitors, I also participate in marketing and promotion activities (we have Instagram page we use, but also we do door to door visits people whom we think that we can give them our information (Offices, colleges schools) so that they can come and visit, I also attend exhibitions trade fairs (Sabasaba and Nanenane fairs)	Knw-impl Dat-col
3.	Researcher	What types of decisions do you make on your daily work?	
4.	Info4	As a tourism promotion officer, I have been making different decisions for example I have been deciding on solving some problems or conflict for the guest maybe they are stuck somewhere, network problems when they do payments – I communicate with chief park warden (decide if they can stay and pay later), some decision is for tourist to enjoy their stay in the park. Sometimes as a professional in tourism I decide to advise the chief park warden on what we can do to make the department to do somethings that can add value to the park example we can decide to make some promotion materials that can make the dissemination of information to many people (like the Instagram page so I advised the chief park warden to initiate this page).	Knw-impl Knw-syn
5.	Researcher	If we take for example what you mentioned last on promotions, how do you know that now we need to do promotion?	
6.	Info4	Yeah, of course promotion is very important if you want to get enough customers, if you want to make people know your services you need to do promotion	Cul-non
7.	Researcher	In making such decisions, what do you base on? do you have a baseline for making such decisions	
8.	Info4	Of course, it depends, it can be experience on the daily base activities you can see some things that need improvement, so I advise the park warden. But me as a professional there are some things that I can see that I need to decide and share to the park warden. These are	Cul-non

		professional skills I acquired during training and the experience at work (in my career)	
9.	Researcher	Are these professional skills based on some kind of data or what exactly?	
10.	Info4	You know when you are at school there is some important skills that you acquire from the school that will help you in your career, we try to apply them when we are working so that we can get their output in those skills.	Cul-non
11.	Researcher	If you can take decisions to improve the (tourists experience) what data/information would you like to have?	
12.	Info4	Yes, the booking is there for communication from the customers if they want to do the booking they need to communicate to someone who is responsible for the booking, so I have been getting the information of the customer or guest through that, so for good booking experience the information I need it is from the guest or the customer - personal details, if they need accommodation what type of accommodation, what date of arrival, and maybe how many nights the customer intend to stay in the park that is some information like that.	Dat-col
13.	Researcher	How would you collect this data? When and where?	
14.	Info4	I will get this from the communication from the customers through email or phone calls, or sometimes direct talk to the customer or their tour operators at the main gate.	Dat-col
15.	Researcher	How would you get feedback from tourists?	
16.	Info4	Yes, we have a comments book at the exit gate, in their accommodation facilities, so far we have the email where the customer can give the feedback.	Dat-col
17.	Researcher	How would you organize/consolidate the data collected?	
18.	Info4	Actually, what we do, we group those data into two categories, we have some comments which congratulate what we are doing, and we have the data of the complaints for what did not do as was required. So, we see, especially we deal much with those complaints that have been giving us the basis to improve our services. We look for those that show we are not doing good in a certain area so that we can do the improvement.	Dat-org Inf-sum
19.	Researcher	Who is responsible in organization of these data	
20.	Info4	What we are doing we have someone like myself – I organize all the information on monthly basis who is just summarizing that information and then each month we have a management meeting and we take the report (Microsoft word) for discussion and way forward and we agree what we will do on those comments. on Microsoft word and print a report.	Dat-org Inf-sum
21.	Researcher	What would you need to analyze the data once it is collected?	

22.	Info4	I would need some assistance (maybe staff) on analyzing the data because it is a lot of them that need to be looked so it takes time	Chall
23.	Researcher	What is missing to analyze the data you collect today?	
24.	Info4	No, I see everything is good and is very clear	
25.	Researcher	How would you present the data once it is analyzed?	
26.	Info4	Printed report because every department has to bring a report on monthly basis so we print ours and submit	Inf-sum
27.	Researcher	Would accessing this data, improve your ability to act at your level?	
28.	Info4	These customers are the one using our services and we align ourselves to their need, so it is very important to have this data in order to keep satisfying them. For example, the increase of the customers can help us improve the facilities in the park, if we see example before covid-19 we have been receiving many tourists each year, the visitors have been increasing so it is one of the indicators that they will increase in the future, so we prepare the facilities and improve them. Like now there is a project called (***) which helps in improving facilities, so we take advantage of that project to make facilities improvement.	Knw-syn
29.	Researcher	What is your opinion on the usefulness of this data for your daily decisions?	
30.	Info4	For example, during the high season, I receive so many bookings and sometimes the customer miss where to stay in the park, so from there we can see from the fluctuation of the booking we can decide in improving the facilities or adding some new ones. We are always struggling to get those information or data of the customer so that we can keep on improving the services to the customers, so they are basis to improve our services from the bad comments.	Knw-impl Knw-impt Knw-pri
31.	Researcher	Once you implement your decisions (based on data), how would you know they work?	
32.	Info4	We receive emails saying congratulating us for improving the services	Knw-impt
33.	Researcher	What would be the stumble blocks/challenges in the organization to decide based on data?	
34.	Info4	First is getting top management support in the proposal that we give them. Of course, we also face a challenge when you advise park warden because some things need the budget so that you can make them work perfect, sometimes we face lack of money so that we can perform things that are causing some problems. Sometimes it is difficult to be understood when you are giving the advice. For example, if you want to do promotion you need some money so if the park warden does not have the budget then you have to wait. Then we have a very poor marketing through which we can get more data to improve services. Currently the private investors within the park are doing well than us and I would say they have good information.	Chall

		We also do not have necessary technology to improve our services to compete at the international level.	
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12 Appendix 5: Fifth Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National Park, and the roles and responsibilities you had	-
2.	Info5	I have been here in the tourism department for 13years	-
3.	Researcher	How much do you use data for your tourism activities in the park?	
4.	Info5	We are being aided with the technology; in the past we used a lot of paperwork so almost everything is being done in the system. Our systems is divided in two, one is control and analysis system and the other payment system. Payment is concerned with all payments of the park (e-permits) and visitors' control and statistics, and in analysis & control - budget tool – control of revenues. We have our IT personnel for managing these systems.	Dat-col
5.	Researcher	In analysis and control, which kind of analysis is being performed?	
6.	Info5	Analysis which is being done is for instance you need visitors data by nationality, or by activities such as walking safari or game drive so we just query in the system and get the data.	Inf-anl
7.	Researcher	What kind of data do you collect from the visitors?	
8.	Info5	Yeah, our visitors are divided into three, non-resident, age groups (adult/children), Expatriate, and Students.	Dat-org
9.	Researcher	At what point do you capture this data?	
10.	Info5	Okay, when the visitor wants to enter the park, they select the activities and fill in the details, this is mostly done with the tour operators.	Dat-col
11.	Researcher	For instance, you want to add activities for the visitors, what do you do?	
12.	Info5	We consider the needs of investors, we have sources of attractions, so if the investor is interested in investing in any, we allow them to do that.	Cul-non Knw-impl Knw-pri
13.	Researcher	How do you satisfy your customers?	
14.	Info5	Through services. They get services on time and road infrastructures are also good.	Knw-impl
15.	Researcher	How would you get feedback from visitors	
16.	Info5	We have visitors book, we give them to sign and write their comments and also we give them links such as travel advisor links so that they can comment on us there.	Dat-col
17.	Researcher	How do you make decision on repairing or opening road infrastructure?	
18.	Info5	We deal with attractions and visitors must reach the attractions, so we build all roads which go to the attractions.	Knw-impl Cul-non
19.	Researcher	Do you know where the tourists go when they enter the park?	
20.	Info5	No we do not. But we just go by experience, like now I know most of the animals location, so if visitors enter the park I know where they will be heading. Also, by tour companies, I know where they usually take their tourists so that is another way. Because they like to be unique, and they have special guests with unique interests in our park. We used to have an app which tour operators and even our staff could go with it in the park and will be marking where they see something interesting and through that we used to know where animals are, but	Chall Cul-non Dat-col

		that ruins the adventure (tourism enjoyment), tourists need to search for animals. As a department we cannot decide on our own	
21.	Researcher	As a tourism officer what kind of data do you need?	
22.	Info5	I need data on rare species, I need to know where these rare species are located so that I can do effective marketing, not that we don't have systems which has these data but they are at other departments and they are not linked to our systems so that we can use them for our decision making.	Knw-syn Chall
23.	Researcher	Would accessing this data, improve your ability to act at your level?	
24.	Info5	Yes if we present data in the management it will be ease for them to agree with our proposal, for instance if we want to repair roads we have to show some data like that of visitors which signifies the wear of the road.	Inf-anl
25.	Researcher	What is your opinion on the usefulness of this data for your daily decisions?	
26.	Info5	It is very useful especially for facilities management and control, ensuring cleanness of the park, and roads networks within the park	Knw-impl
27.	Researcher	What would be the stumble blocks/challenges in the organization to decide based on data?	
28.	Info5	For instance, for the outside marketing, tour operators help us, they sell the park via their company, this is something that we can do by ourselves but for now we are slow. Also the comments book is manual, a visitor has to write on a book which is time consuming and some refuse to comment and sometimes you ask them to leave their contacts but they don't. In compiling this feedback is sometimes tedious, so I wish we can make this book digital or keep it in a system it will help us get feedback very fast.	Chall Dat-col

13 Appendix 6: Sixth Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National Park, and the roles and responsibilities you had	-
2.	Info6	I have been working for the National Park for 5 years now, as tourism officer, and at the park as a tourism department we do several activities which are also my responsibilities, such as making sure that all visitors obtain the required services when they visit the park, making sure that they follow the rules and regulations, ensure that all areas that the visitors visit are clean and at a good condition, making sure that all visitors have paid for the right park fees depending on their needs and they exit on time based on the conditions of their permit, we also prepare rules, terms, conditions and policies but not major policies for the visitors and the park for example the walking safaris or night game drive.	Knw-impl Knw-implt
3.	Researcher	What types of decisions do you make on your daily work?	
4.	Info6	We make decisions such as opening new routes/roads that the visitors will pass, this we do in collaboration with department of ecology, deciding on where the visitors will visit in the park, repair of facilities, and adding new attractions for our visitors.	Cul-non
5.	Researcher	For instance, you want to open new routes what do you do?	
6.	Info6	If we want to open a new route, we sit as a department and discuss, and members will propose different designs and if we agree that is it. For instance, some of the routes naturally close because there were no visits in this pandemic. So now we design new activities and open routes towards those areas and when visitors come, we propose to them based on the new activities	Cul-non
7.	Researcher	How do you arrive to such decisions, what are the basis?	
8.	Info6	We look at the area, if we see they are attractive we consult the department of ecology to analyze the environmental impact, and if it they say it's okay, we request funds and open the route. The issue of adding activity, we do a study and write a proposal to the headquarters, and they make decision.	Inf-sum Cul-non Dat-col
9.	Researcher	For all the activities you mentioned, how do you know that now you need to add an activity?	
10.	Info6	It is based on demand, for instance the tour operators can come with the idea of establishing an activity that they saw on other parks. Also, sometimes the visitors can propose. So, it is either we come up with the idea and share with the stakeholders, or the stakeholders come with the idea and share with us.	Cul-non Dat-col
11.	Researcher	Which kind of visitors' Data do you collect here?	
12.	Info6	Visitors data entering the park, data of ongoing activities in the park such as camping, walking safari and game drive,	Dat-col, Dat-org
13.	Researcher	What exactly do you collect from the visitors and when?	
14.	Info6	When a tourist come, they register on our system – Nationality, Age (adult/child), category (expatriate, non-resident, east Africa citizen), crew, students. We collect this data when a visitor wants to pay for park entry fees (during payment).	Dat-org Dat-col

15.	Researcher	Apart from this visitor dataset what other data do you have or collect?	
16.	Info6	As a tourism department we don't have other data if we need other data such as of animals we go to the respective department. And also, we have the facilities data, such as how many campsites and we go physically to count them and they are not in a system but we just keep on spreadsheet document.	Dat-org Dat-col
17.	Researcher	How do you do promotion/marketing?	
18.	Info6	We participate in exhibition, we prepare radio and TV session, and door to door promotion, we participate in international exhibition, we use the embassies, in football matches etc.	
19.	Researcher	How do you know now you need to do marketing?	
20.	Info6	Uhm we look and target where we can get many people, for example during the exhibition, or during December seasonal vacations when schools have closed.	Knw-pri Cul-non
21.	Researcher	What will be different from last year's promotion to this year's?	
22.	Info6	Each time we come up with a different strategy, we know like last year we did not do well so this time what we missed last year and improve it. Also adding more promotional materials etc.	Knw-pri Knw-syn
23.	Researcher	How do you measure the impact of this year's promotion/marketing?	
24.	Info6	Most of the times, what help us to measure is the bookings we get, so we sit and look this time promotion has brought how many bookings, sometimes during promotion you receive bookings on the spot.	Knw-impt Dat-col
25.	Researcher	What kind of data do you need to be effective in your role?	
26.	Info6	If I have data which shows increase and decrease of animals, it is easy when you do marketing to show them or tell them with the data, also the data on increase or decrease of visitors and citizens on the neighboring villages, data on their interests, data on facilities.	Inf-anl Knw-syn
27.	Researcher	How would you analyze this data?	
28.	Info6	As a department we sit and discuss what we have for instance if we want to establish an activity, we sit and look into this data.	Inf-anl
29.	Researcher	If visitors enter the park, do you have ways of knowing where they are and what they are doing?	
30.	Info6	Yes, we have our patrol vehicles they monitor everything in the park.	Dat-col
31.	Researcher	So you as a manager if you want to know where these visitors go, how would you know?	
32.	Info6	Here we communicate with patrol vehicles, there is no systems which has these data here. So, we depend on the patrol staff.	Dat-col Chall
33.	Researcher	So do you think when you have this data will it help you in any way?	
34.	Info6	Yes, this will be helpful even to control the impact of visitors on the park.	Knw-impt
35.	Researcher	How do you know the activities you have will be of interest to your visitors?	
36.	Info6	Most of the times we consult the visitors, when they come we ask their interests and their expectations of the park, you must find out what they want, for instance if you have oriented them or give them introduction we ask them what are their interests.	Dat-col Knw-impt

37.	Researcher	Do you have ways of knowing what visitors want before they reach the park?	
38.	Info6	No, it's until they arrive at the park, although sometimes some visitors can call for booking and you ask them, so you get to know.	Dat-col Cul-dat
39.	Researcher	Do you have a booking system here?	
40.	Info6	No we don't have it as a system, but visitors call or email.	Dat-col, Chall
41.	Researcher	How do you know that visitors are satisfied?	
42.	Info6	First of all our staff are well trained and we trust them, and also we have a visitors book where they will write us feedback, we also give them our contacts they can email us or call to give feedback.	Dat-col Cul-non
43.	Researcher	How would you organize/consolidate the data collected?	
44.	Info6	We do it ourselves as a department, like for instance here am the one organizing this data.	Dat-org
45.	Researcher	How would you present the data once it is analyzed?	
46.	Info6	The head of department will for instance prepare a graph or give numbers in his report. But in our system you just export the data into spreadsheet where you can manipulate it and draw graphs or anything you want, I have not seen in the system where it can generate graphs or anything like that.	Inf-anl Kw-syn Chall
47.	Researcher	Would accessing this data, improve your ability to act at your level? When you sit in a meeting do you consult this data?	
48.	Info6	It depends with the meeting, for example if you want to add a picnic site they will ask you why, and you say maybe the number of visitors has increased, so you must show them the statistics.	Cul-dat Kw-impl Kw-syn
49.	Researcher	What would be the stumble blocks/challenges in the organization to decide based on data?	
50.	Info6	The biggest challenge here is we don't have control of the funds any longer as it used to be in the past. So, everything is at the central government. If we want to do anything that require funds, it is a long process to get it done, and sometimes it can be postponed. The tourism business requires quick decisions, so this is a problem for us.	Chall

14 Appendix 7: Seventh Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National Park, and the roles and responsibilities you had	-
2.	Info7	I have worked for national parks for 18 years now but at this national park this is my third year and I here am the head of tourism department	-
3.	Researcher	Do you have any data on tourism impact on the surrounding villages?	
4.	Info7	We do not have secondary data on this, but by going through the district profiles you can see their revenue and its basis. But at the park, Leaving the general overview, if we take it in the park context, we can go into the outreach program, but we as park we do not have such data.	Knw-syn Chall
5.	Researcher	What are the basis of most of your decisions as a park tourism manager?	
6.	Info7	We have guidelines many of them such as GMP which has categorized the resources and activities that are to take place in the park, we have marketing manual, tourism operation manual, quality management manual, standard operating procedures etc. so all these are supposed to guide one in carrying out tourism operations. It guides what to do for every department. Other guides in all those for instance campsite or new product you design, there is a section of customer expectation or advise, so the system shows which product has done well in the park.	Cul-non Dat-col
7.	Researcher	Why are most of these documents not online even the annual report?	
8.	Info7	For me I can say just Rigidity or carelessness of some of the responsible staff, because in the past they used to publish these documents but later they stopped and started making some excuse like they are confidential documents etc. We have a lot of documents but most of the staff do not use them. In the past our leaders used to assign us some tasks, but they don't tell us if we are implementing a particular plan or we are following a certain guideline. So you can find the top leaders know these but the subordinates do not know them.	Chall
9.	Researcher	What if what you want to do is not in the guideline?	
10.	Info7	We use the standard operating procedures	Cul-non
11.	Researcher	If you want to know the interests of the customers/visitors do you have ways to do so?	
12.	Info7	No, interest no, it's until you do visitors' surveys that's when you will know. So, I will guess by looking at the products that have done well in the system. The best group to know the interest of the visitors and influence the attractions are the tour operators when they receive the bookings. The best information can be obtained from the tour operators.	Knw-syn Dat-col Chall Cul-non
13.	Researcher	What if the tour operators refuse to share such data?	

14.	Info7	That one we can put it as a risk, but we depend on each other in this business. But I agree with you we need to have such data. For instance, I participated in the preparation of the GMP where I need to show my projections and expectations, so if I say I will do marketing based on customer profile that will be helpful to know their interests and, I will know for sure that if I advertise a particular attraction to a certain group of people it will be of interest to them.	Cul-non Chall
15.	Researcher	So based on the system that you have demonstrated to me, how do you obtain this data?	
16.	Info7	We get them when the visitors make payments at the gate. Our IT personel we give them our requirements based on what we want on the system, and they design it. For instance, in the past, we use to struggle getting the nationality of the visitors, but we raised a concern to our IT people and they solved it.	Dat-col
17.	Researcher	What you use the Nationality for?	
18.	Info7	For marketing. We use social media, international trade fairs, we also go to their countries.	Knw-pri Knw-impl
19.	Researcher	How is the analysis done?	
20.	Info7	In the system everyone can get what they want. For instance, those at headquarters can query a report of all the parks like revenue, or activities, or nationality etc. we also sit and discuss with stakeholders different issues based on what we have.	Inf-anl Dat-col Knw-impl
21.	Researcher	How would you measure the impact?	
22.	Info7	If we go to china to do marketing, we will see Chinese number increase, if we go to America also the same.	Knw-impl
23.	Researcher	Do you use this data on your activities?	
24.	Info7	It depends on what I want, sometimes I use it to gather insights and share with other departments and most of the times I use the guidelines that I told you earlier.	Knw-syn Knw-pri
25.	Researcher	Is there anything that is missing to analyze the data?	
26.	Info7	Uhm most of the things at least are there, but if you had seen it from the beginning, things have been changing. If I need something and it is not in the system, I will just consult the IT people as I told you earlier. For example, there are some of the facilities were not in the system and whenever visitors need to use them, they must pay, to it was a trouble until when I complained, and they fixed it. Also, it was difficult to accrue the funds obtained from such facilities.	Knw-syn
27.	Researcher	How do you communicate with the IT personel?	
28.	Info7	It depends, sometimes I call them and express my concern on something, and they sit to see if it is okay, and if it works, they give me feedback and communicate with head of tourism department at headquarters for approval.	Knw-syn
29.	Researcher	Do you have IT personnel at your park?	
30.	Info7	No not every park has these IT people, but the organization has now started to hire them now so there are some parks already have them.	Chall
31.	Researcher	These IT personel at each park, are they able to customize the system based on your needs?	
32.	Info7	No, they are just technicians for troubleshooting and maintenance of IT related issues at the park, so for the system issues there is	Chall

		someone at headquarters I communicate with, he is a programmer.	
33.	Researcher	What are the challenges that you are facing on using data for decision making?	
34.	Info7	I think it is communication between the system people and us (users), sometimes it is hard to make them understand what I want in the system for me this is a challenge, but things are changing slowly because if I compare from where we are coming from, we are better off now.	Chall

15 Appendix 8: Eighth Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National Park, and the roles and responsibilities you had	-
2.	Info8	I am a tourism officer at the department of marketing and business tourism and this is my fourth year	-
3.	Researcher	In your role what are basis of decisions you make?	
4.	Info8	In such, at TANAPA the answer is one, most of organization in the government are being led by guidelines which are put, for instance if it is to prepare a new product, you must consult the GMP on the park to see what I required so it is a must to follow the guidelines. But it depends on what you want to work on because the guidelines for everything are there. So now there is no using of personal direct skills. For example, you see things now moving into digital, for now when we started digital move, the government gave out directives towards this move and all the organizations under it prepare their plans and strategies based on the government directive. So for all new things or inventions the government will give a directive.	Col-non
5.	Researcher	What does tourism management at headquarter level involve?	
6.	Info8	We deal with supervising all the attractions available at all national park Manage the revenue for all parks Diversify products where there is a need. Promotion of the parks both domestic and international (preparation of all marketing and promotional materials) There is nothing which can be done at the parks without being approved at HQ, now we have a section called marketing business development so it's all about business, so now anything must go through HQ unlike those days when we can innovate anything and work on it without consulting HQ.	Knw-impl
7.	Researcher	How do you do international marketing?	
8.	Info8	We use digital components like social media due to covid, but mostly we do attend all the famous international trade fairs in collaboration with TTB and the ministry.	Knw-impl Knw-impl
9.	Researcher	For instance, you want to introduce a new product what are the basis?	
10.	Info8	We consider the area and the need for the product, you cannot say that you want to start cable cars at a park while it is not feasible, that is why there are surveys being conducted for establishing one safari which does not exist in Tanzania. So you start by looking at which parks have received such a request, but also why at that park, then the assessment will be done and that is how it is done.	Knw-pri Cul-dat
11.	Researcher	Don't you have data or live data that you can consult instead of conducting surveys?	

12.	Info8	No, research has to be done, things are now changing unlike in the past, although there are those general assessments which are already done but products differ because of technological changes, so a lot of things have to be done again.	Dat-col Chall Cul-dat
13.	Researcher	So what is the main driver for product diversification?	
14.	Info8	To increase visitors or activities that the visitor can do at the park or to add the days which the visitor will spend in the park. Because if the visitor only intended to do game drive, probably they can finish in a very short time, so diversification is necessary so that they can spend on other activities, and we also get some revenue.	Cul-non
15.	Researcher	How do you know that they will like it?	
16.	Info8	Oh yeah, we do the surveys now, we usually to ask them. In the past we use to do paper-based questionnaires but now there is survey monkey, google forms, so when they arrive, we give them links, but also, we ask tour operators to know if they are aware of such activities.	Dat-col
17.	Researcher	So apart from the survey that you do, do you have any other ways of gathering their preferences?	
18.	Info8	Apart from surveys, there are guidelines as I have mentioned earlier, and apart from that TANAPA doesn't have another source unless it exists, and I am not aware. You know at TANAPA we offer the opportunity to do tourism business, but we do not know the tourists' behaviors or interests. Those who know the interests of the visitors are the tour operators, they know them very well. For instance, we may have an idea of introducing a product, we can follow the guidelines and the impact assessment conducted but knowing the interest of the visitors we will have to consult the tour operators.	Cul-non Chall
19.	Researcher	Do you have customer profiles or data?	
20.	Info8	Yes we do.	Dat-col
21.	Researcher	At what point do you capture their data and what does the data include?	
22.	Info8	Uh we capture this data when they want to make payments and we capture their nationality, age, category- residents, nonresidents, and expatriate.	Dat-col
23.	Researcher	How do you analyze this data?	
24.	Info8	This is based on the department of tourism at each park, they will collect data and organize them and send them to HQ, and at HQ we write the report and analyze. There is also some data from survey monkey, it analyzes so we don't do much.	Dat-col Dat-org Inf-anl
25.	Researcher	How do you present such data?	
26.	Info8	I just present my report to the management.	Inf-sum
27.	Researcher	Don't you have data specialists at your department?	
28.	Info8	No we don't have this people at our department, they are there at the department of planning, for example if I submit the report it will be taken to the planning department and they do the quarterly reports, but they do general things.	Chall
29.	Researcher	Do you think when having such data available will help you to be effective in your role?	
30.	Info8	Yeah Of course, because you will know exactly what you need or how to improve where to focus, where to sell where to put more efforts and things like that.	Knw-pri Knw-impl Knw-syn

31.	Researcher	How do you assess the impact of activities or diversification of the product?	
32.	Info8	Auditors will audit the activities based on the revenue, this is done at the system directly.	Inf-anl Inf-sum

16 Appendix 9: Ninth Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National Park, and the roles and responsibilities you had?	-
2.	Info9	Of course, I have been at TANAPA for 13 years now and I have been working in the department of marketing and business tourism.	
3.	Researcher	I wish to know, what are the basis of the decisions you make in your department?	
4.	Info9	We as a government institution we have guidelines that guide our operations and there are data which are used in the process. For the past years that I have been doing this job, there has been data that we use in many areas. Let me start with the area of my expertise, for you to know this is a potential market (growing, mature, or declining) you must obtain data – of course it is historic data, there is some data that we have in our databases and that which we get from UNWTO projections	Cul-dat Cul-non Dat-col Knw-syn Knw-impl
5.	Researcher	When you talk of historic data from your database or UNWTO which kind of data?	
6.	Info9	Number of visitations, expenditure of the market on the normal holidays. On number of visitations, we look at where do they go and how many or how do they spend. Yes, people travel, but where do they go and what do they do... that is what we look at. So this helps us to know for instance is China or Europe or America a potential market for us. So we get them from UNWTO and internally we also have them, also at the ministry every year they do visitors exit survey.	Dat-org Inf-anl Knw-impl Dat-col
7.	Researcher	Apart from external data as you mention, what data do you capture you as TANAPA?	
8.	Info9	We have visitors' data which is captured during reservation or payment, number of visitors, nationality, or residents, we also generate number of days spent in the park. All this is in our system and is used for marketing. If we come to product development, we use data such as surveys -visitors surveys, and book of comments. We look at what the visitors are interested in, their level of satisfaction, they tell us through emails or phone calls and also meeting with stakeholders.	Dat-col Knw-impl Knw-syn
9.	Researcher	Do you have a specific person for analyzing these data?	
10.	Info9	Of course, we do it ourselves, there is no need for someone else while we can manage it because data analysis is something you can learn depending on the software, but this time we use survey monkey, but in the past, we use software such as SPSS.	Chall Inf-anl
11.	Researcher	How do you present this data?	
12.	Info9	We present depending on the requirement, if there is a certain requirement, we prepare a report with data on such requirement for example we want to know the level of satisfaction, we just query in the system, so if the management says they want proposed new product we prepare the data and present as long as the requirement was in the survey questions.	Inf-anl Inf-sum

13.	Researcher	Do you have ways of knowing customer satisfactions apart from the surveys?	
14.	Info9	Yes we have so many WhatsApp groups, now technology has simplified things social media apps are there and we get feedback (Facebook, Instagram and delegated email for customer care), we also sit with stakeholders to hear their comments.	Dat-col
15.	Researcher	How do you analyze these data?	
16.	Info9	We compile, discuss and prepare a report of the meeting, this is all done in all social media as well so we write a report also.	Inf-anl Inf-sum
17.	Researcher	Do you have customer profile apart from the one you mentioned earlier?	
18.	Info9	As I said the data we capture are the nationality or residence or age, etc. if we want to know interests is through our surveys, the organization is not a regulator of tourism in the country, our mandate is conservation, the one who prepares the policies of tourism is the ministry, we have our stakeholders who are the investors within the park and tour operators but we don't license them. So we keep records of our stakeholders for our own interests. Here tourism is driven by private sector, if you want details of the visitors the tour operators have them but for us we don't keep them. Based on the surveys of the ministry, almost 70% of the tourism business is through tour operators but not on individual basis. Saying this does not mean that we are restricted from getting such data from the visitors, but if we keep them what will it help us with? Currently there is an ongoing debate that a visitor should handle things on their own like payment of park fees wherever they are but not yet presented anywhere.	Dat-col
19.	Researcher	What difficulties are you facing on using data for decision making? (Challenges)	
20.	Info9	Actually, we need a system that can capture the real tourism impact data in the country (protected areas included), because we do not have anywhere the actual value spent by the tourist in our country right from when they arrive to their departure. There are events which pull the tourists, but they are not documented anywhere (e.g. kili marathon), this is a huge challenge.	Chall
21.	Researcher	Do you have a digital strategy?	
22.	Info9	Yes we do have a digital marketing strategy. How it works I will refer you to someone else you can get some explanation	
23.	Researcher	Do you have any challenges in using data for making decisions?	
24.	Info9	That question everyone will have different challenges, but as for me I face one challenge worth mentioning although this was a serious issue in the past but now it is being handled for instance the mismatch between visitors and the revenue collected like you received 40 visitors but the revenue reports that you have received 70 visitors. And this occurs in scenario like, one visitor can visit two parks but at each park he/she is considered as a new entry, (visitations are not arrivals). It is a problem in data collection there is a confusion. Also lack of integration like our systems are not linked with the immigration system but why are they not linked? No answers. So that is a challenge.	Chall

		<p>Also there are some technology I heard of intelligence artificial [artificial intelligence] yes, I think it is what we need because if we have it here, it will help us to sell more products than we currently whoever decides for the visitor is the tour operator, so if the system is opened up to such technology, visitors will see that you have got more products that they did not know and they can as well choose them. Our tourism is skewed to the interests of the tour operator he sells what is beneficial to him, it is so mechanical I will say. So we must open up and agree that tourism is not the task of tour operators only.</p> <p>The organization is so complicated you can bring up such good innovation and they will weigh based on the priority, our parks are in the remote areas, we cannot establish a smart gate for instance while people are struggling with network connection you see</p>	
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17 Appendix 10: Tenth Interview Transcript

S/N.	Speaker	Content	Theme
1.	Researcher	Can you tell me about yourself, how long have you been working for the National Park, and the roles and responsibilities you had	-
2.	Info10	I have been working at tanapa for 4 years now as a IT staff, and my role has been to support staff on IT related issues, troubleshoot computer problems, system maintenance and support.	-
3.	Researcher	What are the challenges you face with the systems?	
4.	Info10	<p>Currently we have so many systems because there were so many projects and each project ended up with a project which was out-sourced, and the biggest challenge now is that we do not have these projects and we are forced to do inhouse development, so there are situations you come up with an idea and you have to hold on they will tell you we have other priorities. We have really good people, but we do not use them well because there are so many bureaucracies.</p> <p>Also, all these systems are not integrated and they are bombarded by network problems, like today in the reservation system I have had to reset like 9 passwords, just the system refused the normal passwords. The system misbehave a lot, sometimes you can open and you get enough errors but that is how it is.</p>	Chall
5.	Researcher	Do you have systems which are for analysis of the data you collect?	
6.	Info10	We have one but it is limited to auditors only, but it does not give reports like the statistical reports for instance in excel drawing graphs or something like that and it does not do anything like predictions or heavy analytics like in business intelligence. The analysis am talking about is done in a very small percentage.	Inf-anl
7.	Researcher	How is the data presented in the system, is it with some visualizations or just numbers?	
8.	Info10	The system does not draw graphs, if you want graphs you have to export that data into spreadsheet where you can draw graphs and charts, what the systems does is organizing the data and let the user export or view and generate report either in pdf or word or excel.	Chall Dat-org Inf-sum
9.	Researcher	For instance, if you are monitoring parks do you have ways to visualize what is going on?	
10.	Info10	No, that one we don't have. Maybe that is more into business intelligence things like the covid dashboard etc. we would love to have it but currently we don't have it.	Chall
11.	Researcher	Are there situations when you are requested by the management to prepare a summary of these data in your systems?	
12.	Info10	No that is was only requested by the tour operators. There is one who requested the statistics of the visitors that were brought by his company only and we gave him like a report.	Knw-imp
13.	Researcher	So at TANAPA now do you have data specialists?	
14.	Info10	No, we don't. we only have programmers and people of revenue who manage the revenues only and he is a programmer.	Chall

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