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Chapter

# Interplay between Technology and Culture in Driving Change for Employee Satisfaction

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## Abstract

Technology and society have been in constant interplay since the early man's invention of simple tools. Among modern interplays are e-press, digital technologies, and the internet of things (IoT). Based on a critical review of existing literature, the study investigated how organizational culture is driving employee's actions to embrace change through technological innovation, and how this interplay result to organizational competitiveness. The study used qualitative design to collect data, which was manually analyzed using the researcher's insight and research skills to bring out the main themes. After analysis, the study found that technology is a key driver of innovation, and innovation is an enabler for organizations' to consistently achieve superior performance. In organizations, technological innovation and culture interact to influence organizational behavior which drives economic change, productivity and long term growth. When embraced by organizational employees, technological innovation can lead to high employee performance. The study concludes that people through culture shift, have adopted technological innovation for their organizational superior performance. The study recommends that governments train their organizations and help them buy technologies in form of digital computers and Information Communication Technologies for connecting individuals, promotion of values, mutual respect, and innovation.

**Keywords:** change, customer satisfaction, interplay between technology and culture, organizational excellence, technological innovation, technology and society

## 1. Introduction

Culture has been seen to refer to the shared patterns of beliefs, values, customs, behaviors, and artifacts that characterize a group or society [1]. It has been found that employees tend to be attracted to those organizations with a culture that values their work and focuses on organizational wellbeing; and that there is a positive relationship between organizational culture, job satisfaction and the organizational commitment of employees [2]. According to Griswold [1], culture encompasses the concept of social roles, relations, cosmological ideas, and material possessions that a group of people acquire over generations through their individual and collective

efforts. Likewise, Samovar et al. [3] sees culture encompassing the learned behaviors and shared experiences of individuals within a relatively large social group, which are passed down through social learning. As a result, culture represents the way of life of a particular group, including their behaviors, unquestioned beliefs, cherished values, and symbolic expressions that are transmitted through communication and imitation from one generation to the next [3]. While studying American best run companies in 2006; Peters and Waterman [4] observed that organizational culture influences a variety of organizational and individual outcomes including productivity, performance, commitment and self-confidence.

According to Samovar et al. [3], culture can be seen as a form of symbolic communication, comprising the collective skills, knowledge, attitudes, values, and motives of a group, as well as the patterns and tangible manifestations in artifacts, traditional concepts, and shared mental programming that distinguish members of one group from others. When positive culture is implemented in an organization, it has been seen to contribute immensely to shaping employees' perceptions and behavior, as well as the principles that apply to members of an organization in south Asian firms [5]. This study investigated the role of organizational culture in driving employee's actions; how organizations drive cultural change through technological innovation and the symbiotic relationship between technological innovation and organizational competitiveness.

### **1.1 Statement of the problem**

Despite the many initiatives started by the governments, the united nation organizations, and other world bodies aimed at improving customer satisfaction in their working relationship with their employers, gaps still exist regarding what drives employees' commitment towards their organizations [2], Specifically, bilateral agreements, laws and binding treaties are signed at international forums between governments on the safety, security and wellbeing of employees while at work, yet at national levels employees continue being unlawfully laid off, given low salaries and exposed to dehumanizing working conditions [6]. Technological innovations worldwide is improving enormously creating enhanced organizational production processes and majority of employees desire to adopt to new technologies as opposed to existing technology [7], yet working conditions within their employer premises remain deplorable [6]; and that the relationship between technological innovation and organizational cultural change [6], and that there exists a strong relationship between technology and culture in driving change for employee satisfaction whereas Bagozzi, Davis and Warshaw observes that actual usage of technology may not be a direct or immediate consequence of the desire, attitude or intention to use the technology [8]. This study therefore investigates the symbiotic relationship between technology and culture in driving change for employee satisfaction.

### **1.2 Study objectives**

The study's general objective was to investigate the symbiotic relationship between technology and culture in driving change for employee satisfaction while its specific objectives were to analyze the role of organizational culture in driving employee's actions; evaluate how organizations drive cultural change through technological

innovation and assess the symbiotic relationship between technological innovation and organizational competitiveness.

The study findings are expected to help organizations and their employees to adopt positive technological innovations for employee satisfaction, assist government of Kenya and other stakeholders to formulate good policies which can result in positive organizational culture change for employee satisfaction as a result of technological innovation; and finally enrich existing theories for use by other researchers and academicians in disseminating knowledge in the field of symbiotic relationship between technology and culture in driving change for employee satisfaction.

## **2. Theoretical background and informing literature review**

The study is anchored on the technology acceptance model which postulates that people's behavior is a factor that is influenced by the *desire to use* technology. The model suggests that when users are presented with a new technology, there is a myriad of issues that influence their decision of how and when to use it, namely: *Perceived usefulness* which according to Davis F [9] is "*the degree to which a person sees that using a specific system would enhance his job performance* and, *Perceived ease-of-use*, which is "*the degree to which a person believes that using a particular system would be free from effort*" [9]. As a result, *external variables* such as social influence come to play when determining the attitude. When these external factors are in place, people will have the desire and positive propensity to use the technology. However, this intention may change depending on one's age and gender.

The technology acceptance model is one of the users' acceptances and usage of technology model according to Venkatesh V. [10]. Since its development in the early 1989, it has replaced many of the TRA's attitude measures. It has strong behavioral elements which assume that when someone forms a desire to act, that he will be free to act without limitation. The model is a widely adopted concept to demonstrate the acceptance of new technology fields. It attempts to demonstrate and predict people's behaviors with their beliefs, attitudes, and behavioral intention. In it, perceived ease of use, perceived usefulness and considered general beliefs play a significant role than salient beliefs in attitudes towards utilizing a particular technology [7]. However, the model has been criticized in that there are many constraints in the real world which curtails the freedom to act. Likewise, attitude towards usage and intentions to use may be ill-formed or lacking which implies that actual usage may not be a direct or immediate consequence of such attitudes and intentions [8].

## **3. Research methodology**

The study used a descriptive research design to collect qualitative data. According to Mugenda and Mugenda, this in-depth design has been used successfully by other researchers to design and communicate their findings. Secondary data was primarily gathered through a literature review (desk research). To bring out the main themes, data was manually analyzed using the researcher's insight and research skills. The emerging themes were then operationalized for content analysis and to make sense and determine the significance of the study. Following the necessary explanations based on the findings, the conclusions and recommendations were summarized.

#### **4. Study findings and discussions**

According to Hofstede [11] there are five dimensions of culture, which are Individualism or collectivism, Power distance, avoidance of uncertainty, masculinity or femininity, and long-term or short-term orientation. Individualism and collectivism refer to the degree of importance individuals place on their relationships with others within a society. In highly individualistic cultures such as Kenya, Nigeria, and Britain, people tend to prioritize their individual identities and actions over group affiliations [12]. These cultures emphasize self-reliance rather than dependence on the collective. Conversely, in highly collectivist cultures like Tanzania and Pakistan, individuals primarily identify themselves as members of a group [13]. They are expected to dedicate themselves to the welfare of the community, and the community, in turn, is expected to provide support and protection in times of need.

Culture plays a significant role in how power disparities are perceived and accepted within a society. It influences the level of inequality considered normal or acceptable. In countries where power disparities are prevalent, the culture tends to view such inequalities as a regular part of social dynamics. One way to observe these differences in power distance is through the manner in which individuals address each other. In high-power-distance countries such as Japan and Mexico, individuals use formal titles when communicating [14]. On the other hand, in the United States, it is common for individuals to address each other by their first names in most situations, whereas such informality might be considered disrespectful in other cultures [15].

Cultural orientation refers to how cultures cope with uncertainty about the future. A strong cultural preference for structure situations is referred to as high uncertainty avoidance. Individuals in countries such as Portugal and Greece, for example, rely heavily on technology, religion, and law to provide them with a sense of security and rules on how to behave. Individuals in countries with low uncertainty avoidance, such as Jamaica and Singapore, appear to take each day as it comes [11]. Cultural orientation highlights the significance placed on traditionally masculine or feminine practices and qualities. In a “masculine” culture, there is a strong emphasis on achievement, financial success, assertiveness, and competition. On the other hand, a “feminine” culture places a greater value on relationships, service to others, care for the vulnerable, and environmental preservation. Japan and Germany are examples of masculine cultures, whereas Norway and Sweden are considered feminine cultures.

Cultural values can be oriented towards either the future (long-term) or the present and past (short-term). Cultures with a long-term orientation place importance on persistence and saving, as they believe it will yield benefits in the future. Several Asian countries, such as China and Japan, are examples of cultures that exhibit a long-term orientation. Short-term orientations, such as those found in West African, American, and Russian cultures, encourage respect for past tradition while also fulfilling social obligations in the present [16]. In today’s world, a distinction between strong and weak cultures has become more prevalent. The argument posits that strong cultures have a greater impact on employee behavior and are directly associated with lower turnover rates. In a strong culture, the organization’s core values are deeply ingrained and widely shared among its members. The strength of the culture is determined by the extent to which individuals wholeheartedly embrace and commit to these core values. According to this definition, a strong culture exerts significant influence on member behavior due to the high level of cohesiveness and intensity, creating an internal environment characterized by strong behavioral control. Nordstrom



serves as an example of a company with a highly robust service culture in the retail industry. Employees at Nordstrom have a clear understanding of the expectations placed upon them, and these expectations play a substantial role in shaping their behavior [17].

#### **4.1 Culture influence of organizational behavior**

Employee turnover should be reduced as a result of a strong culture. A strong culture demonstrates that members agree on what the organization stands for. Such unity of purpose fosters loyalty, cohesiveness, and organizational commitment. These characteristics, in turn, reduce employees' proclivity to leave the organization. A strong organizational culture reduces the need for management to extensively rely on formal rules and regulations to govern employee behavior. A culture is considered weak when its members are unaware of its behavioral rules, traditions, rituals, and beliefs, or when there is inconsistency between behavior and stated values. This may be due to lack of knowledge of what the organization stands for. Weak cultures work against an organization's success [18]. In contrast, weak cultures frequently result in poor performance. Weak cultures also have a slew of unhealthy traits that can stymie an organization's ability to achieve its goals and succeed.

Scholars the world over have identified weak cultures to have some of the following traits: *Isolated/narrow thinking*: When an organization avoids looking outside itself for best approaches and practices, it exhibits this trait. These organizations' employees believe they have all the answers [19]. This type of inward thinking can keep a company from making necessary procedural and cultural changes; and, *Resistance to change*: When an organization is suddenly confronted with a rapidly changing environment, this trait becomes apparent. The organization is concerned with maintaining the status quo, avoiding mistakes, and avoiding risks. It is the culture's leadership that allows these factors to paralyze and pervade the organization, rather than focusing on success and innovation.

On how employees Learn Culture, the following have been suggested by many scholars;

*Story telling*: This practice involves the transmission of significant stories across generations within specific cultures. For example, during Henry Ford II's tenure as chairman of Ford Motor Company, it was challenging to find a manager who had not heard the story of Mr. Ford reminding his executives, in moments of excessive confidence, that "it is my name that is on the building." The underlying message was unmistakable: Henry Ford II held the ultimate authority and leadership within the organization [20]. Similarly, Nike employs several senior executives who actively serve as organization storytellers. These individuals dedicate a significant amount of their time to sharing stories that effectively convey the essence and values of Nike as a company [21]. For instance, they might recount the tale of Bill Bowerman, the co-founder and former Oregon track coach, who famously used his wife's waffle iron to pour rubber and create a better running shoe. These anecdotes, while entertaining and often eliciting laughter, are intended to exemplify Nike's spirit of innovation. New employees, on the other hand, might hear stories about the challenges faced by running star Steve Prefontaine in his pursuit to professionalize the sport and obtain improved performance equipment. These narratives highlight Nike's commitment to supporting athletes. Such stories are prevalent within many organizations and typically encompass a range of events, including those involving the organization's founders, rule-breaking, remarkable success stories, downsizing, employee relocations,

responses to past mistakes, and the organization's ability to adapt and overcome challenges. By grounding the present in the past, these stories serve to explain, legitimize, and reinforce current practices;

*Rituals:* Rituals are repetitive sequences of actions that serve to express and reinforce the core values of an organization, prioritize goals, identify important individuals, and establish a sense of expendability. One well-known example of an organization ritual is Wal-Mart's company chant, which involves employees enthusiastically chanting the letters of the company's name. This ritual, initiated by the company's founder, Sam Walton, was designed to motivate and unify the workforce [22] while emphasizing the significance of employees in driving the company's success. Similar organization chants are also employed by other organizations such as IBM, Ericsson, Novell, Deutsche Bank, and PricewaterhouseCoopers. These rituals serve to unite employees and reinforce the founders' beliefs in the pivotal role of their workforce for achieving organizational objectives;

*Material symbols:* This involves construction of infrastructures in such a way to depict certain ranks or positions in the organization. For instance, Alcoa's headquarters do not appear to be typical organization headquarters for any "Tom and Dick" [23]. Even high-level executives have minimal individual offices within Alcoa, as the company predominantly utilizes cubicles, communal spaces, and meeting rooms. This informal organization layout serves as a symbolic representation of Alcoa's emphasis on transparency, equality, creativity, and adaptability. It communicates to employees that these values are highly valued within the organization. Some corporations provide limousines for top executives, as well as organization jet when traveling by air. While some individuals may not have the privilege of traveling in luxury limousines or private jets, they may still have access to company-provided transportation such as a car or air travel. However, the car provided may be a Chevrolet, and when flying, they may occupy seats in the economy section of commercial airliners. Material symbols encompass various aspects such as the physical arrangement of organization headquarters, the automobiles provided to top executives, and the presence or absence of organization aircraft. They also include factors like office size, the quality of furnishings, executive privileges, and attire. These material symbols serve as a means of communication to employees, indicating the individuals who hold significance within the organization, the level of egalitarianism preferred by top management, and the expected behaviors, ranging from conservative to risk-taking, participative to authoritarian, social to individualistic [20];

*Language:* Language plays a significant role in identifying and preserving the culture or subculture within organizational units and organizations. Learning and using specific terminology within a culture demonstrates acceptance and contributes to its preservation. For instance, employees at Knight-Ridder Information utilize terms like "accession number" (assigned to individual records in a database), "KWIC" (keywords-in-context), and "relational operator" (searching a database for names or key terms in a specific order). Similarly, new employees at Boeing must familiarize themselves with a distinct vocabulary of acronyms such as "BOLD" (Boeing online data) and "CATIA" (computer graphics-aided three-dimensional interactive application). Organizations frequently generate unique terminology to refer to their equipment, offices, important personnel, suppliers, customers, or products that are linked to their activities [24]. Initially, new employees may feel overwhelmed by the acronyms and jargon, but after around 6 months on the job, these terms become an integrated part of their language. Once learned, this specialized terminology serves as a shared language for members of a particular culture or subculture within the organization.

## 4.2 The concept of organization culture

Organizational culture refers to “a system of shared issues and beliefs held by organizational members that determines how each individual acts towards one another”. It can also be defined as an organization’s shared values, attitudes, and practices. It is your company’s personality, and it has a large impact on your employees’ overall satisfaction, as well as the consistent organizational behaviors of employees and leaders [25]. From this definition, we can deduce that culture is description of a perception of a relationship between the organization and its persons, or glue that keeps organizations together. As a result, individuals within the organization end up influencing the culture just as much as the culture influences them. Hofstede’s Multi-Focus Model consists of six separate variables or dimensions that offer understanding regarding the alignment between the existing culture and strategic direction. By considering different combinations of these dimensions, valuable insights can be gained regarding strategic compatibility, and the outcomes can be presented visually in an easily understandable manner according to Farinha [26] as follows:

*Dimension 1: Means oriented vs. goal oriented:* This dimension is strongly linked to the effectiveness of the organization. In a means-oriented culture, the primary focus lies on the methods and processes of work execution, with individuals identifying and aligning themselves with the “how” of accomplishing tasks. Employees in a goal-oriented culture are primarily motivated to achieve specific internal results or goals, even if these involve significant risks; people identify with the ‘what’ [27]. People in a means-oriented culture perceive themselves as avoiding risks and exerting minimal effort in their jobs, despite the fact that each workday is essentially the same. In contrast, in a highly goal-oriented culture, employees are primarily motivated to achieve specific internal results or goals, even if these involve significant risks;

*Dimension 2: Internally driven vs. externally driven:* Employees in a highly internally driven culture take may not take their responsibilities seriously, believing that business ethics and honesty just comes naturally. Such employees need to have a great understanding of what is beneficial for both the customer and the broader world. In contrast, in a very externally driven culture, the emphasis is on meeting the needs of the customer; the emphasis is primarily placed on achieving results, and a practical approach takes precedence over an ethical stance;

*Dimension 3: Easy work vs. strict work discipline:* Internal structuring, control, and discipline are introduced in this dimension. A relaxed culture is characterized by a flexible internal framework and a sense of unpredictability with a lack of discipline and control; there is an abundance of surprises and improvisation. A strict work discipline reveals the inverse. People are extremely cost-conscious, serious, and punctual;

*Dimension 4: Local vs. professional:* Employees within a local company tend to align themselves with either their supervisor or the specific department they belong to. In a professional organization, an employee’s identity is determined by his profession and/or the nature of his job. In a highly localized culture, employees typically prioritize short-term goals, have a strong internal focus, and face significant social pressure to conform to the norms of the group. Conversely, in a highly professional culture, the situation is reversed;

*Dimension 5: Employee oriented vs. work:* Management philosophy has a strong connection to organizational culture. In employee-oriented organizations, there is a belief that personal matters are recognized and that the organization takes accountability for the welfare of its employees, even if it means compromising



work goals. Conversely, in work-oriented organizations, there is considerable pressure to prioritize task completion, even if it means disregarding the welfare of employees; and,

*Dimension 6: Close system vs. open system:* This dimension focuses on the level of inclusivity within an organization. In a highly open culture, newcomers are warmly received, and the organization is open to both internal and external individuals. It is presumed that nearly anyone would be able to fit into the organization. On the other hand, in a highly closed organization, the situation is reversed.

### 4.3 Hofstede's cultural dimensions

According to Farinha (2018), Hofstede's cultural dimensions have the following strengths:

- Comprehensive study of how national culture influences organization values: sample of over 116,000 employees from over 70 countries
- This seminal work emphasizes the importance of understanding national cultural differences and the implications for multinational corporations.
- Updated on a regular basis.
- Qualitative studies support the findings by validating and clarifying them.
- Capability to account for other variables, such as organizational culture.
- Objections to Hofstede's Cultural Dimensions
- A survey is a "blank instrument" for illuminating the complexities of national culture.
- Describes but does not explain what is happening, relying heavily on qualitative studies to 'validate' and elucidate findings.
- Organizational culture may not be constant, and there are other non-national cultural sources.
- Generalizes organization findings and other selective samples such as students to societies.
- Failure to account for differences between countries, such as strong regional subcultures.
- Some differences between countries are omitted, for example, the United States and Australia have similar scores for cultural dimensions, but there are differences in work motivation: (responsibility and recognition vs. job security and monetary rewards).
- D'Iribarne suggests that survey questions and interpretations may be invalid.

- Power disparities are very high in France, but D'Iribane argues that power is not the same as hierarchies. While France has extensive organization hierarchies, managers have little power.
- Questions may be ambiguous, for example, high work stress is not a proxy for Uncertainty Avoidance.
- D'Iribane's research includes interviews and observations.

Acknowledging that organizational culture possesses shared characteristics does not negate the presence of subcultures within a given culture. In most large organizations, there is a dominant culture that reflects the core values embraced by the majority of its members. Additionally, a diverse range of subcultures coexist within the organization. When we talk about an organization's culture, we are talking about its dominant culture. The macro perspective of culture is what gives an organization its unique personality. In large organizations, subcultures form to reflect common situations, experiences, or problems members are faced with. These subcultures are usually defined by department; for example, a department may have a subculture that is shared only by members of that department. It will include the dominant culture's core values as well as values specific to members of the purchasing department. Similarly, an organizational unit or office that is when a unit or department is physically isolated from the main operations of an organization, it can develop its own unique identity. While the core values are generally maintained, they are adapted to suit the specific circumstances and challenges faced by the separated unit.

A strong ethical standard is more likely to be established in an organizational culture that demonstrates a high level of risk tolerance, moderate aggressiveness, and a focus on both means and outcomes. Managers in such a culture are encouraged to take risks and innovate; they are encouraged to avoid excessive or unrestricted competition; and they will pay attention to how and what goals are achieved [20]. A strong organizational culture exerts a more pronounced influence on employees compared to a weak culture. When the culture is robust and promotes high ethical standards, it is likely to have a substantial and positive effect on employee behavior. A notable example of a company with a strong culture is Johnson & Johnson, which has long emphasized its organization responsibilities towards customers, employees, the community, and shareholders.

#### **4.4 How organization culture determines employee's actions**

Organizational culture is depicted as the manner in which members of an organization establish connections and interactions with each other and their work. The perception of relationships with the external world, in comparison to other organizations, can either hinder or enhance an organization's strategy. Organizational culture plays a significant role in shaping these relationships. The Hofstede Insights on organizational culture is a strategic tool aimed at assisting companies in becoming more functional using a comprehensive representation of the following:

- How employees truly relate to their organization's culture which ensures a consistent representation across employee recruitment messages and the practical working environment.

- The readiness of an organization to accept change; for example, are employees experiencing a lot of nervousness; is there enough trust; and are the relevant experts prepared for the change?
- How have the existing practices and desired practices within an organization align with the ideal culture to support the implementation of specific strategies, with the available resources and time?
- How proficiently can management utilize their behavior to establish a standard or example (lead by example)?
- How indirect change initiatives can help ensure a better fit between the current and optimal ways of working.

#### 4.5 Importance of organization culture

Organizational culture makes it easier to achieve an organization's strategic goals. The culture portrays the organization's core values and gives a reflection of the leadership of the organization. A strong company culture will attract the best candidates and keep them engaged as employees. Research shows that up to 77% of adults would take into account a company's culture prior to applying for a job opportunity [28]. Perhaps more importantly, 56 percent consider organizational culture to be more important than compensation. It takes time and effort to develop a winning organizational culture; Ensuring that your culture accurately represents your values and is in line with your overarching mission is a significant undertaking, but do not give up: your efforts will be rewarded in the end.

The organizational culture becomes apparent in how decisions are made, whether through a top-down or bottom-up approach, and in the level of comfort employees feel in expressing their thoughts and opinions without the fear of negative consequences. It is reflected in the organization's benefit plans and in how employees are acknowledged and rewarded for surpassing expectations in their work. The Competing Values Framework is the most well-known classification of organizational culture types. At the University of Michigan, Kim Cameron and Robert Quinn identified four distinct types of organizational culture. Every organization possesses a distinctive combination of the four types of organizational culture, with one usually prevailing over the others. As the organization grows in size, the likelihood of having multiple cultures increases. While this can bring advantages, it may also present challenges in maintaining a unified culture, especially in geographically dispersed or globally operating organizations.

#### 4.6 Types of organization culture

According to Cameron and Quinn, organizational cultures may be categorized into four types as follows:

- *Adhocracy culture*: This type of culture is characterized by a dynamic and entrepreneurial environment.
- *Clan culture*: This culture focuses on fostering collaboration and maintaining a friendly atmosphere.

- *Control culture*: This culture emphasizes structure, processes, and hierarchy.
- *Market culture*: This culture is driven by competition and a strong focus on achieving results.

It is critical to understand the type of culture change we are attempting to effect with the appropriate technology tools, as well as how this tool will enable the desired culture. Information Technology will drive significant change not only in technology but also in processes, team reorganization, and so on during a digital transformation or organizational culture change. The company is expected to assess its own processes to see what can be streamlined or automated to improve efficiency and the employee experience. As the rate of technological innovation accelerates and competition for faster delivery in the shortest time becomes more important in determining winners and losers in the software industry, it is essential that organizations adopt approaches that are research-driven.

DORA's 2018 Accelerate: State of DevOps report adds to the tech community's current understanding of what drives performance by introducing many new findings, but the following are a few highlights:

SDO performance unlocks benefits such as increased profitability, productivity, market share, customer satisfaction, and the ability to achieve organizational goals. High performance is driven by mastering key technical practices such as monitoring and observability, continuous testing, database change management, incident response and management, and integrating security earlier in the software development process. Forbes Daily features our best stories, exclusive reporting, and Forbes perspectives on the day's top news, as well as insider information on the world's most influential entrepreneurs [29]. When aiming to attain exceptional performance as a technology-focused organization, industry makes no difference.

#### **4.7 Implications for non-technologists**

The ability of technology companies to create, test, and deploy software updates is becoming increasingly important for all of us. Just imagine if every time you tried to log into your preferred online shopping platform, your purchases were consistently unable to process. This would not only jeopardize the provider's revenue potential, but it would also greatly degrade the customer experience which is not acceptable in an age when consumer purchasing habits are becoming increasingly reliant on technology and convenience. Based on the latest research from DORA, organizations that fall under the category of elite performers (referring to the highest performing organizations) can deploy code updates 46 times faster than others. They are also 7 times less likely to experience change failures, but are 2604 times faster at recovering from incidents than their peers. There is no doubt that such levels of performance can have tangible and measurable impacts on the market.

While many conversations about improving deployment velocity acknowledge the influence of organizational culture, it is often treated as a secondary consideration. This tendency is not unexpected, as technology-focused discussions tend to prioritize topics such as continuous delivery, cloud infrastructure, availability, continuous testing, and deployment automation. People are still struggling to wrap their heads around the topic of culture [30]. Unfortunately, this does not diminish its significance in terms of long-term success. The DORA study explored the impact of culture on performance within the technology sector, confirming the importance of this topic as



discussed in recent years. The study utilized Ron Westrum's model of organizational culture as a measure of culture.

This study has identified several key cultural realities that aid in the elicitation of best practice behaviors among technology teams that should be highlighted. The findings indicate that team dynamics are far more important to performance than individual skills of team members. Researchers at Google conducted a comprehensive study on more than 180 engineering teams, revealing that psychological safety emerged as the primary predictor of high performance. The study also highlighted the significance of other factors such as dependability, structure, clarity of work, and the sense of meaning and impact. Psychological safety fosters a culture where team members feel secure in taking actions that contribute to performance, such as cooperation, openly addressing issues without fear of reprisal, breaking down barriers between departments, conducting thorough reviews of past projects, and continually experimenting to drive progress.

The insights from DORA's study are highly significant as they shed light on the transformative impact of reevaluating notions of responsibility, accountability, and the traditional blame game within prestigious software development and operations companies. According to J. Paul Reed, a consultant in the field of DevOps and a human factors researcher, this paradigm shift holds profound implications for these organizations' ability to execute effectively in the market. In this year's DORA study, there was a novel focus on the role of leaders in influencing culture. The research findings indicate that leaders who empower their teams by granting them autonomy in performing their jobs foster a sense of trust and provide a platform for employees to express their opinions. These factors, trust and voice, play a crucial role in shaping the organization's culture. As for leaders, what specific behaviors can they adopt to facilitate the exercise of autonomy by their teams?

Several intriguing research findings from DORA stand out: Clearly establish and communicate goals, while granting employees the autonomy to determine the best approach to achieve them.

- Simplify rules to eliminate obstacles and streamline processes.
- Enable teams to modify rules that hinder progress towards goals.
- Encourage the team to prioritize positive customer outcomes, even if it means deviating from established rules.

DORA's research findings also validated the significance of conducting post-mortems or retrospectives in influencing performance and fostering a culture that appreciates the value of such activities for overall success. Retrospectives create a secure environment where teams can thoroughly analyze their work, identify effective practices, and make necessary adjustments to improve future outcomes. Their objective is to enhance their understanding of intricate systems and foster a culture of continuous learning throughout the organization, involving individuals at all levels, from code developers to top executives. This shift to continuous learning in a psychologically safe environment aids in shifting the organizational culture to support future efforts, resulting in a generative cycle aimed at improving performance.

Culture, being a complex and profound concept, exerts a multifaceted influence on the performance of technology organizations, a depth that we are only just beginning to grasp. Despite the challenges associated with measuring and comprehending

culture, it is crucial not to undermine its significance in driving velocity within the technology sector. Rather than merely acknowledging its importance and swiftly moving on to more tangible aspects of technology, it is imperative to prioritize the understanding and evolution of tech firms' cultures to foster the necessary behaviors for driving velocity. Neglecting culture poses a clear and imminent threat to organizations seeking to undergo technological transformation [31].

#### 4.8 Organization culture as a driver of employee satisfaction

Employee satisfaction refers to whether or not employees are happy and content, and whether or not their desires and needs are met at work. When employees are willing to adapt to the organizational culture, they are highly satisfied. They are less or completely dissatisfied when they are unwilling to adapt to the organizational culture [32]. Organizational culture is manifested in how an organization conducts business, treats its employees, customers, and the larger community. It is the degree to which decision-making autonomy and freedom are allowed, as well as the development of new ideas and personal expression. Finally, organizational culture determines how power and information flow throughout the organization hierarchy and the level of employee commitment to collective goals. A strong organizational culture can help drive business results, but determining which elements of the culture can lead to superior performance requires a cultural audit (**Figure 1**).

When employees embrace a strong organizational culture, it can lead to high employee performance. For example, if the organizational culture is innovative and employees enjoy improving and trying new things, this can lead to high performance. However, if the organization's culture is opaque and unaccepted by its employees, it can lead to poor performance. For example, if the organizational culture is team-oriented and the employee is individualistic, low performance may result. Strong organization cultures lead to social control, social glue, and frequently aid in decision making. Strong organization culture content, on the other hand, may be incompatible with the organization's environment, may focus attention on one mental model, and frequently suppress dissenting values from subcultures.



**Figure 1.** Dimensions of organizational culture profile (OCP). Source: Adapted from information in O'Reilly et al. [33].

#### **4.9 Technology: emerging technology or appropriate technology**

Technology can be described as the practical utilization of scientific knowledge to meet human needs and goals. It involves the manipulation and alteration of the human environment for various purposes. There are a number of terms used in relation to technology as follows:

#### **4.10 Emerging technology**

The term “emerging technology” typically refers to a new technology that is in its early stages of development. However, it can also encompass the continuous advancement and evolution of an existing technology. The specific interpretation of this term may vary depending on the field in which it is used, such as media, business, science, or education [34]. The term is commonly used to describe technologies that are in the process of being developed or are anticipated to become available in the next 5–10 years. These technologies are often characterized by their potential to have substantial social or economic impacts.

Emerging digital technologies have created new opportunities while also posing new legal challenges, particularly in the areas of intellectual property, trademarks, patents, royalties, and licensing. The emergence of new digital communication technologies and media has presented new challenges related to the reproduction and distribution of copyrighted works [35]. In response, various stakeholders, including the government, affected industries, and public interest groups, have been actively addressing these issues. Their actions aim to establish appropriate measures and legal frameworks that protect the rights of copyright holders, provide clarity to digital technology companies, and serve the interests of the public and other involved parties.

#### **4.11 Appropriate technology**

Appropriate technology refers to a movement that promotes the use of small-scale and locally accessible technological solutions. These solutions are characterized by decentralization, reliance on labor rather than capital, energy efficiency, environmental sustainability, and local autonomy. The concept was initially described by economist Ernst Friedrich “Fritz” Schumacher as “intermediate technology” in his book “Small Is Beautiful” [36]. Both Schumacher and present-day advocates of appropriate technology emphasize the significance of technology being centered around people’s needs and well-being.

Appropriate technology has been applied across various domains to address different challenges. Examples of such applications include water pumps and other equipment powered by bicycles or hand-operated mechanisms, the invention of bicycles themselves, the universal nut sheller, self-contained solar lamps and streetlights, and the design of passive solar buildings [37]. These well-known instances demonstrate the practical implementation of appropriate technology in solving specific problems. Today, appropriate technology is frequently developed using open source principles, which has resulted in open-source appropriate technology (OSAT). The open-source appropriate technology (OSAT) movement has made numerous technology plans readily accessible through the Internet, allowing for widespread availability and adoption [38]. This approach to technology has been suggested as a viable model to foster innovation in sustainable development.

Appropriate technology is most commonly discussed in relation to economic development and as an alternative to more capital-intensive technology transfer from developed to developing countries. However, both developing and developed countries have appropriate technology movements. The appropriate technology movement in developed countries arose from the energy crisis of the 1970s and is primarily concerned with environmental and sustainability issues. Today, the concept is multifaceted; in some contexts, appropriate technology can be defined as the most basic level of technology capable of achieving the intended goal, whereas in some contexts, appropriate technology refers to engineering practices that consider the social and environmental implications in a comprehensive manner. The facets are linked by toughness and sustainable living.

Appropriate Technology is a concept that pertains to sustainable community advancements and initiatives characterized by long-term considerations regarding components, maintenance, investment, and operation. This concept emerged as a response to the failures observed in large-scale, high-cost development approaches that proved unworkable due to issues such as inadequate infrastructure, lack of parts, or insufficient technical expertise following their initial implementation. These failures often occurred when solutions successful in one region were indiscriminately applied to different areas without considering the specific contextual differences.

The concept of Appropriate Technology emerged as a response to the inappropriate introduction of High Technology solutions into communities and economies that were unable to sustain them in the long term. Dr. Eric Schumacher established the 'Intermediate Technology Development Group' (ITDG) in 1966 with a focus on addressing the needs of some of the world's poorest communities. Schumacher recognized that large, costly, and advanced technological solutions that might be successful in wealthier regions often proved ineffective when implemented in areas with inadequate infrastructure or significant environmental differences. According to the ITDG, the essence of this alternative development approach lies in adopting a local and small-scale perspective rather than a national and large-scale one. It emphasizes the creation of numerous low-cost workspaces where people reside, particularly in rural areas, and utilizes appropriate technologies suited to their specific needs that can be created and controlled by the people who use them, allowing them to be more productive and earn money."

#### **4.12 Technology and innovation**

Technology is a key driver of innovation, and innovation plays a vital role in the success of small and medium-sized enterprises (SMEs). The effective utilization of technology and the ability to innovate act as significant facilitators for SMEs, offering them opportunities for growth and development at the individual enterprise level and the broader level of the industry. These factors contribute to understanding the variations in growth rates observed at the firm, regional, and national levels. Therefore, technological innovation holds a central position in driving economic change, serving as the ultimate source of productivity and long-term growth. According to Stiglitz [39], it is through technological innovation that economies consistently achieve superior performance. The adoption of technology among small and medium-size enterprises is a subject of increasing importance, particularly in developing countries. While there are established theories on technology adoption that have been extensively studied in Western contexts,



their application to the specific context of developing countries has been limited. Technology adoption is also critical for private-sector business growth.

#### 4.13 Technology as a change agent

Companies of all sizes are using technology to support their cultures. However, it is not only the technology itself that is important, but also the opportunities that technology provides. A new ERP implementation or change, for example, may necessitate a complete reengineering of business processes, how people interact internally and externally (Customers), and how the business is perceived in the market. All of these outcomes will undoubtedly have an impact on profit. Another example is how technology is influencing new modes of communication. Solutions such as Microsoft Teams, Slack, and others have brought new ways of meeting and sharing in the organization, and this is undoubtedly the new normal.

Having said that, it is critical to understand that every technology decision cannot be made solely based on the acquisition of technology, but must also take into account the impact of people adoption and engagement, such as training approach, how friendly the adoption curve will be, and so on. Wrong technological decisions made without these considerations will slow the cultural change and cause it to lose momentum. Employee engagement is required for a positive employee experience, but measuring the health of a company's culture is difficult. The percentage of employees who participate in the programs and the feedback they provide, as well as other statistics such as changes in turnover and absenteeism, or in the achievement of business objectives, indicate whether a company is making progress. According to Rhonda Gardner's article "Leading a Successful Cultural Transformation at Your Organization," cultural transformation will occur on multiple fronts, including how people behave and work. When done correctly, this has a positive impact on business outcomes (**Figure 2**).



**Figure 2.** Cultural transformation. Adopted from Rhonda Gardner [40].

#### **4.14 Important considerations when driving change through technology**

- There is no “one-size-fits-all” strategy or recipe, but the following points must be included in the Cultural Change from Tech agenda:
- As with any strategy, full top-level engagement and sponsorship are required. Nothing will happen unless it is present. “Change” will not occur unless all key stakeholders agree to it.
- As an IT leader, you must be a change agent. You will need to be an evangelist for how technology will drive change, empower those who use it, and propel the business to new heights. On the other hand, being a leader entails the obligation to “deliver.”
- Maintain clear and consistent communication about what is going on and how things are progressing. The two most important factors in achieving results are clear project management and lean communications.
- Ensure adequate funding and resource allocation. Any major endeavor will necessitate cultural change.
- We will not discuss cost, but rather investment. Cost is sometimes necessary for business operations, but the difference is that when you invest rather than spend, you are focusing on and delivering profit!
- Make a road! Cultural change is laying the groundwork for the company’s future, so you must pave the way. This must be done through persuasion, engagement, and delivery.
- Rule and set a good example! You will not achieve the above if you and your team are not ready for the challenge and the significant effort that change entails. You and your IT organization must be the first to buy-in and believe in the path that must be taken before others will.
- When driving engagement, keep the standard distribution gauss bell approach in mind. It is critical who you bring over first in order for others to follow! (See my article “Another Cultural Transformation Talk!” for more information.)
- Always set the bar as high as possible while remaining realistic! Setting reasonable goals rarely yields high results. However, if you raise the bar, you will be able to accomplish more.
- Encourage, encourage, encourage... Gain momentum as you go. When people are motivated, they are much more productive. Sometimes a price is given, and other times only recognition is given. You will be astounded at how a simple gesture of recognition can affect people and teams. Make success as public as possible, and keep corrections to a minimum!
- Continue to evolve while also delivering. When the company believes that cultural change has occurred, do not stop there. Begin working in the new or

next phase. Because culture is inextricably linked to time and chronology, it is a living thing. Markets change, and businesses must adapt to meet new demands, new ways of doing things, and technological advancements. As a result, we must consider that culture will need to go through a period of change in the future, or at the very least suffer and adapt over time. Prepare for it by planning ahead of time and anticipating the requirements. Culture will need to evolve, so we must plan for cultural change evolution.

- The only constant in life is change! Once again, cultural change will occur through persuasion rather than mandate.
- Construct safe heavens. Always be honest when it comes to setting expectations.
- Deliver only what you can commit to. Underperformance or poor performance is a cultural killer. Over delivering can sometimes mean that you did not set the bar high enough.
- Implement internal marketing and branding. Using project names and mojos to drive engagement and identification across the organization during the adoption and team identification process. It will also facilitate communication.
- Put the leadership to the test. As an IT leader in the midst of a technological cultural shift, you will need to challenge your colleagues. Some will be simple, but others will require you to kick some doors and desks.
- Be a pragmatic leader when it comes to dealing with problems and constraints. To avoid losing momentum, do not take too long. This is especially true when working on high-impact projects.
- Have fun on the ride. Take the cultural transformation seriously, but enjoy the journey because it will become part of your DNA.

#### **4.15 Using technological innovation to drive cultural change**

According to Bryan Walker and Sarah A. Soule “Culture is a breeze. It is imperceptible, but its impact can be seen and felt. Smooth sailing when the wind is blowing in your direction. Everything is more difficult when the wind is blowing against you.” From IoT to block chains, data lakes, and AI, the raw potential of new technology is astounding. While the usability of many technologies is improving, comprehending the specific ways in which a technology can bring about transformative opportunities remains highly challenging. It is especially difficult to adapt technology to specific needs of the company and integrate it with current processes. To make matters worse, most businesses have deeply embedded legacy systems that are difficult to change. Solving these problems requires individuals with a strong technical background, a broad understanding of the subject matter, and the capacity to collaborate effectively within the larger organization. The reality is that most data in many industries today is not up to basic standards, and the rigors of change necessitate far better data quality and analytics.

Data presents an intriguing paradox; transformation entails understanding emerging types of unstructured data, massive amounts of data from outside the

business, leveraging and incorporating proprietary data. Today's technology can assist businesses by allowing them to collect data on the environment, health, and safety. Predefined requirements are now being assessed through leading indicators using straightforward online and offline protocols, which have become more significant than lagging indicators. This facilitates the collection of compliant information and, more importantly, encourages ongoing improvement in environmental, health, and safety practices, as well as cultural transformation. It is critical to act on the data once it has been obtained. Businesses can respond to such cases within predefined parameters and bring them to a satisfactory conclusion using technology. Furthermore, comprehensive EHS and compliance software systems give organizations a centralized location for consistently logging events, assigning corrective actions, analyzing root causes, and reporting on incident rates. Numerous organizations are utilizing specialized and integrated mobile applications for incident management on iOS and Android platforms to enhance EHS management and reporting. These apps enable employees to conveniently document findings or report incidents while on the go. Use of Apps can also provide offline support if the user is not connected to the internet; tasks and activities can be added and completed on the go, and data can be synchronized to the cloud later.

#### **4.16 Interplay between technology innovation and competitiveness**

People created the language so they could communicate with elders and learn from their stories. They created tools for agriculture, homes, and weapons for hunting and protection. As the population grows, more technology is developed. Technology has not only extended human life spans but has also changed the way we live [41]. The invention of the printing press revolutionized access to information, enabling widespread dissemination of news, increased literacy rates, and the establishment of communities within cities to preserve and support diverse cultures. Every nation and community have their own unique coherence, culture, tradition, and social norms and values. The living standards have greatly improved and become more sophisticated as a result of technological advancements [42].

Kacker explains that the term "innovation" originates from the Latin word "innovare," which conveys the concept of creating something novel. Innovations entail fresh approaches to tasks and are linked to elements such as risk, potential failure, unconventional management perspectives, and the need to abandon outdated practices. Drucker defines innovation as the process of introducing enhanced capabilities or improving utility. Another perspective describes innovation capability as the organization's capacity to create innovative solutions in response to changing contexts and opportunities, without causing significant disruptions, excessive time and costs, or compromising performance. The advancement of technology innovation has led to various benefits such as improved precision in business planning, enhanced marketing efficiency, increased global sales, streamlined management practices, real-time monitoring capabilities, and prompt customer support. Entrepreneurs acknowledge that innovation not only enhances the quality of products or processes but also contributes positively to the economic outcomes of small businesses.

According to Oslo, there are four primary types of innovation. These are process, product, service, and marketing innovation. Process innovation involves implementing new or significantly improved production or delivery methods that causes substantial changes in production techniques in an organization. Product and service innovation entail introducing new or significantly improved goods or services in



terms of their intended use or characteristics. Marketing innovations involve implementing new marketing methods that include changes to product design, promotion, pricing, and placement. Organizational innovation, also known as strategic innovation, refers to the adoption of new organizational methods in a company's business practices, organization, organization, or external relations. Technology plays a vital role in driving business innovation, which, in turn, increases value, improves quality, and enhances productivity. For SMEs aiming to increase profits, innovation is the most rapid and effective pathway to achieve that goal.

#### **4.17 Technological impact on culture**

The culture of a society can be seen its values and practices. It can be observed through the people through their perceptions, values, practices, and technological transfers. Technological changes have exerted significant influence in various essential elements of cultures, such as art, language, education, mobility, and religion. These aspects form the bedrock of our cultural identity and play a crucial role in shaping our perceptions, judgments, and evaluations of technology. The culture of a community serves as a framework or benchmark through which technology is understood and assessed. Technology plays a pivotal role in shaping the trajectory of cultural development as it permeates all aspects of culture. For technology to become an integral part of a broader cultural dimension, it must align with the social and cultural context of a community. Failure to achieve this alignment can lead to conflicts between technological progress and the preservation of cultural values. In essence, the compatibility between technology and cultural values is essential to ensure harmonious coexistence and balanced cultural evolution. Striking a balance enables individuals, irrespective of their ethnicity, age, or educational background, to freely express themselves within the realm of technology. It helps people to fulfill their aspirations and desires, but the absence of proper restrictions, regulation, and accountability may lead to potential cultural deterioration.

#### **4.18 Technological impact on tradition**

In any community, there is always a struggle between technology and tradition. Globalization has reduced the world to the size of a village due to technological advancements [43]. Imagining modern life without electricity, transportation, communication, and so on takes us back in time. Technological advancements have been instrumental in driving progress in various disciplines such as medical science, engineering, economics, and more. Because of the positive impact of technology, industrialization, urbanization, modernization, transportation and communication development are all possible. It has aided networking of society's culture, tradition, and coherence leading to technological advancements, the twenty-first century has moved so far ahead.

In her TED talks, Sherry Turkle highlights the phenomenon of expecting more from technology while expecting less from human interactions. She emphasizes that our reliance on technology can hinder the development of meaningful relationships with others, as we treat technology as if it were a genuine substitute for human connection. The constant influx of electronic communication, such as texts, tweets, and emails, can also contribute to feelings of isolation and detract from the ability to engage in deep thinking and active listening. Another negative impact of technology, according to Turkle, is the dominance of Western culture over less prominent

cultures, resulting in a disregard for social values which leads to loss of coherent traditional practices. Traditional style thrives when it has a recognized value. Rather than killing tradition, technology aids in the modification of production methods or industrialization. Thus, if the beneficiary part is considered, technology allows for the preservation of tradition.

#### **4.19 Technological impact on social values**

Technology has provided a wide range of topics for discussion. People gain extensive knowledge about any subject, and more information is effectively shared. Technology aids in the transformation of the economy as well as the evolution of new social classes [44]. It can help to strengthen interpersonal connections. It has contributed to all demographic factors of society, for instance, modern farming methods have supplanted traditional agricultural practices, leading to higher crop yields, reduced time requirements, and other benefits.

People spend more time on technology and less time on social activities. Technology has been criticized for the decline of traditional media platforms like television and newspapers. Its widespread adoption has been limited to educated individuals on the fringes of society. The more technology advances, the more human beings regress. The invention of robots and machines has rendered humans lazy and reliant. Technology has led to creation of bombs, nuclear weapons, and missiles. The implementation of technology has an impact on societal values by changing expectations and realities. People have lost trust as a result of overemphasis on technology.

### **5. Conclusion**

Despite the advantages and disadvantages, technology has significantly enhanced our lives. It has effectively conserved valuable resources like time and money, while also promoting global connectivity by turning the world into a closely-knit community. This transformation has facilitated the bridging of cultural, racial, and geographical gaps, enabling people to overcome barriers more effortlessly. The increasing preference for online communication over in-person interactions has a significant influence on culture at both local and global levels, owing to the ease and convenience of connecting through technology and engaging in online communication.

### **6. Recommendations**

The study recommends that organizations be helped to buy and implement Appropriate Technologies in form of digital computers and Information Communication Technologies, which will help to enhance innovative processes in the organizations. Organizations are also urged to train their employees on how to use these technologies as means of connecting individuals, fostering promotion of values, mutual respect, and innovation. Once trained, employees will be able to use the technologies to tell their stories for culture impact and social values, and so as to foster loyalty, cohesiveness, and organizational commitment for economic change, productivity and long term growth. Consequently, the employees will help in their organizational productivity, profitability growth and customer satisfaction.

## **Expected learning outcomes**

1. Description of culture.
2. Role of organizational culture in driving employee's actions.
3. How organizations drive cultural change through technological innovation.
4. Interplay between technology and culture in driving change for employee satisfaction.


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