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Digital Nudging and Organizational Foresight: The Mediating Role of Knowledge Management Engagement and the Moderating Effect of Trust and Ethical Perceptions

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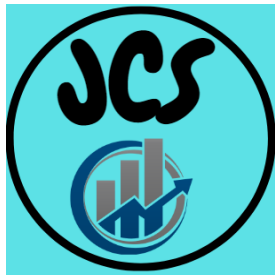
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Abstract

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The proposed research attempts to explore the effect of digital nudging on knowledge management (KM) processes that facilitate strategic foresight, early-warning systems, as well as organization-wide decision-making, and presents an idea of the conceptual framework that could undergo empirical validation in the future and further quantitative analysis. Organizations are progressively dependent on KM platforms to predict risks, identify weak signals, and direct strategic planning but these systems are not effective because of the problems they face like information overload, inconsistent participation of users and poor utilization of the knowledge. According to the latest research, digital nudges (minor interface messages that trigger user behavior without limiting the choices) can enhance attention, decision-making, and online activity. However, they have not been applied to KM-based foresight and early warning setup,

which presents a severe research gap. There are no single theories that can explain all the relevant mechanisms. Choice-architecture / nudge theory should be combined with the Unified Theory of Acceptance and Use of Technology (UTAUT) to create a more comprehensive theoretical basis. The quantitative, deductive research design will be used, as per the Saunders Research Onion, where a steered and organized survey and behavioral evidence of organizational KM platforms will be employed. The target audience will be managers, analysts, and employees with knowledge intensive jobs who have frequent access to KM and tools related to foresight. Structural Equation Modeling (SEM) will be used to test the relationship hypotheses, mediating effects, and the fit of the entire model. The research provides theoretical implications through the extension of the application of behavioral and knowledge-based theories in the organizational contexts. In practice, it serves as a guide to KM system designing that would contribute to increasing engagement and responsiveness to the strategic aspect of user involvement. Further studies should focus on nudging validation in large scale, longitudinal tests of the long-term effects of nudging, as well as the modulate factors involved in workplace nudging, including digital literacy or organizational support, and ethics.



Keywords: Digital Nudging, Knowledge Management Engagement, Organizational Foresight, Strategic Planning Effectiveness, User Trust, Ethical Perceptions, Mediating Effects, Moderating Effects, Knowledge-Based View, Technology Acceptance

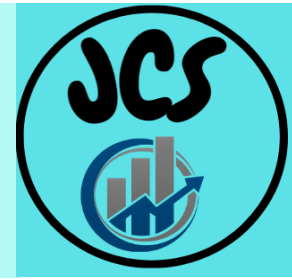
Background of the Study

The digital era has created knowledge as one of the most crucial organizational resources, and companies are increasingly relying on digital platforms in an effort to facilitate the creation, dissemination, and consumption of knowledge. With organizations still operating in highly volatile, uncertain, complex, and ambiguous (VUCA) environments, knowledge management (KM) has become a necessity to both maintain competitiveness and be able to make decisions in advance. Digitalization has increased access to information, made the flow of information faster and revolutionized how organizations extract insights of both the external and internal environments (Nambisan, Lyytinen, Majchrzak & Song, 2017). This change has increased the necessity of the tools that are able to enhance the organizational foresight, strategic planning, and early warning features.

Organizational foresight is a systematic process in which companies read the strengths of new trends, the first signs of the change and form informed opinions about the potential futures (Vecchiato, 2019). As the ever-growing impact of technology has been disrupting markets, consumer behavior has increasingly shifted, geopolitical realities continue to be uncertain and the regulatory regimes continue to change rapidly, foresight has become a significant part of strategic management, rather than a fringe planning activity. Literature shows that organizations that are in a position to identify weak signals at their initial stages stand a greater chance of adjusting, innovating, and experiencing times of turbulence (Rohrbeck and Kum, 2018). Nonetheless, the development of effective foresight systems is extremely reliant on how good the quality and availability of knowledge is in the organization. KM platforms are the core of the environmental intelligence storage, the consolidation of strategic information, and they ensure that the relevant information can be on time and in the hands of decision-makers (Lichtenthaler, 2020).

Nevertheless, with the presence of KM technologies, several organizations are not doing well in terms of ensuring that their employees are regularly scanning, interpreting, and taking strategic information into action. Information overload is one of the critical issues. With the spread of digital systems, employees tend to become bombarded by the immense amount of information and occasionally result in selective attention, loss of message and slowness to react to new situations in the environment (Eppler and Mengis, 2004). Although foresight units or analysts might report, they are not capable of reaching operational managers with the utilization of foresight knowledge (cognitive load), platform complexity, and low usage of KM repositories (Battistella, De Toni & Pessot, 2021). This puts a disconnect between what is known and what is applied by organizations in their strategic decision-making.

In the digital field, the interface design influences user behavior greatly in the process of steering individuals in their way through systems, on prioritization of the content and interpretation of the available information. Digital nudging has become a promising process at this point. Digital nudging is the application of minor design features in digital interfaces like cues, prompts, emphases, defaults, timing, or framing to influence user selections, attention, but not restrict freedom (Weinmann, Schneider and vom Brocke, 2016). Despite these discussing it as part of



behavioral economics and choice architecture, digital nudging has found its way into information systems research due to its possible capacity to enhance user engagement, information search behavior and the quality of decisions in digital platforms (Mirsch, Lehrer and Jung, 2017).

The digital nudging integration into the digital KM systems offers new avenue to solve the problem that has long troubled the strategic utilization of knowledge. Organizations are becoming aware of the fact that it is not sufficient to store information in repositories and just hope that employees will know which knowledge to rely on at any particular moment. Digital nudges within KM systems, like in reports on emerging trends becoming visible, attention to newly identified anomalies, or a suggestion to look at updates to scenarios may prove useful in ensuring that employees do pay attention to foresight-related content and become active users of these systems. Previous studies in digital behavior design have demonstrated that a minor change in interface can have a strong impact on the information processing behavior particularly when less cognitive load is required and the user is likely to persuade themselves more in handling intricate digital information (Meske and Potthoff, 2017).

The significance of these tools is made magnified as in the case of early-warning systems which have the aim of identifying disruptions or critical developments before they are exacerbated. Early-warning depends on constant gathering and determination of cues through varied channels and these are comprised of market records, actions of rival firms, technological progress, and socio-political developments (Kuosa, 2016). Weak signals can however easily be ignored in digital platforms as they can be insignificant or ambiguous at initial stages. Digital nudging can aid this process by capturing the attention of users on unusual patterns, outlining deviations, and promoting the regular use of information dashboard of strategic information. Whereas KM systems have conventionally been oriented towards codifying and sharing the knowledge, the addition of digital nudging may broaden the scope of its functions into the development of more active information-seeking and futuristic behaviors.

The move towards AI-enabled KM environments is another major reason why this integration needs to be conducted. Several modern KM systems have search optimization, recommendation engines, automated tagging, and predictive analytics (North & Kumta, 2018). This has led to more sophisticated systems, yet it has also brought about new problematic issues: users can over rely on an algorithm, ignore essential information, or think that the systems do not comprehend what is going on. Digital nudging is also mentioned as a tool of enhancing transparency, shaping human-AI cooperation, and assisting the users to manage algorithmic results more efficiently (Schneider, Klumpe and Adam, 2022). As an example, nudges may contribute to the attention to other points of view, thinking through the verification of insights prepared by AI, or delving into various sources of information-activities required to be foresightful and strategically plan.

The growth of remote and hybrid working conditions only adds to the topicality of digital nudging in KM systems. The widely spread employees have made digital platforms the main channel of flow of organizational knowledge. It is becoming increasingly difficult to make sure that the strategic insights are communicated to the appropriate actors in such a decentralized setting (Choudhury, Foroughi & Larson, 2021). Digital nudging technologies can produce coherent, organization-wide attention and engagement trends by slightly altering the waterfall of future-oriented hints through the platforms that employees are already working on.



Whereas KM, foresight and digital nudging are examined separately, there has been little research on the intersection of the two. The literature that exists confirms that practitioners have challenges in applying the results of foresight to the day to day activities of an organization (Rohrbeck and Schwarz, 2013). Meanwhile, there has been a significant lack of research by the digital nudging field in terms of middle domains (e-commerce, consumer behavior, and online decision environment) but comparatively little in relation to internal organizational systems or strategic contexts (Meske and Potthoff, 2017). With the push to more adaptive and anticipatory capabilities in organizations, the increased acceptance that integrating digital nudging with KM infrastructures may enhance early signal detection, increased strategic learning, and consistent engagement with foresight outputs is growing.

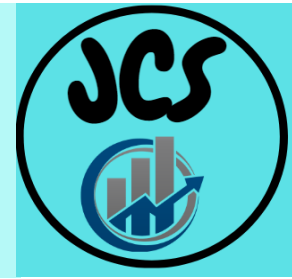
Research Problem

Organizations in the contemporary world have created large digital knowledge management (KM) systems that are purported to collect, retain, and disseminate strategic intelligence, but these systems often fail to provide foresight and warning bells to decision-makers at a time when those warnings may be the most helpful. The issues of information overload and the pace/speed of organizational data put users into inability to detect weaknesses or deviating trends among normal noise (Eppler and Mengis, 2004).

One suggestion to enhance the way in which people engage with digital information is that of suggesting digital nudging through the deliberate adoption of user-interface design, choice architecture to steer attention and behavior in online environments (Weinmann, Schneider and vom Brocke, 2016). Nevertheless, there has been a knowledge gap regarding the operation of these interventions in internal organizational KM systems used to foresight, strategic planning, or early-warning processes as the digital-nudge literature has massively focused on consumer and public-health contexts (e.g., food choice, donations, online transactions) and short-term experiments (Schneider, Weinmann & vom Brocke, 2018).

Where digital nudges have been tested, effects are heterogeneous, and usually small, systematic and field research indicates variation in consequences by type of nudge, context, and population, and most experiments examine short-run behavioral proxy outcomes (clicks, on-the-spot choices), and not more lasting and organizational-level outcomes of foresight (when a disruption is earlier identified, signals are incorporated into a strategic plan, etc.) (Recent reviews and RCT syntheses). This non-connectivity suggests a profound point of doubt regarding extrapolation and whether findings in consumer or educational context should be translated to complex KM contexts where users are highly qualified experts, tasks are unclear, and outcomes are long-term strategic instead of transactional (recent systematic reviews).

In addition to the effectiveness, there are ethical and legitimacy issues that make implementation of nudges in working environments complicated. Researchers opine that nudging in the work place may endanger the independence of workers, operate through the risk of manipulative or immaturity-organized impacts, and present power relations that contrast with those brought by any strategic signals when they occur under the gaze of onlookers (Ruehle, 2023). These ethical issues are important where absence of transparency or perceived manipulation might destroy trust in KM systems and decrease the long-term interaction with foresight outputs.



Epistemologically, the causal influence of a nudge in the KM ecosystems of organizations is challenging: KM platforms change interactions with organizational culture, incentives, and user roles, and it is challenging to trace the relationship between a particular change of interface and significant foresight improvement outcomes over time. Corporate foresight literature also records the value of foresight is often time learned in years and thus it makes short-term experimental studies challenging and longitudinal and mixed-method assessment strategies are required to measure the effects on future preparedness and strategic performance (Rohrbeck and Kum, 2018). Lacking strong longitudinal justifications, the organizations should not be sure that nudging will enhance early-warning uptake or will merely create some noise in behaviours.

Put collectively, these facts paint a clear research problem, namely that, despite the potential promise of digital nudging to guide attention in data-rich digital contexts (Weinmann et al., 2016), there is a lack of long-term, domain-specific, and empirical evidence of which types of nudges, how and to whom, actually stimulate detection, interpretation, and use of foresight and early-warning knowledge within KM systems. This gap in the evidence is combined with the issues of morality concerning workplace nudging and methodological difficulties in listening to strategic outcomes. These multiple issues can be solved by the combination of field experiments and longitudinal interventions in real KM environments and nudges, an ethically sensitive framework of design to work places and evaluating metrics that map nudge interventions to foresight-relevant organizational results (e.g. signal detection rates, time-to-action, incorporation in strategy).

Aim of the Study

This research will investigate the existence and the mechanisms of digital-nudging, interventions in organizational knowledge management (KM) systems to improve the detection, interpretation, and utilization of foresight and early-warning information, which leads to better strategic decision-making and organizational preparedness.

Research Objectives

To determine which form of digital nudges (e.g. interface prompts, default settings, focus on weak signals etc.) will be best applied to encourage the focus of attention towards foresight and early-warning information in KM systems.

To determine the effect of chosen digital-nudge interventions on user behaviour: in particular, do nudges lead to a higher rate and/or timeliness of user access, recognition or response of foresight / early-warning information?

To assess the existence of any long-term engagement with both foresight and early-warning knowledge (not immediate responses) based on digital nudging.

To investigate the user perceptions of nudging in internal KM environments with strategic content (trust, perceived usefulness and acceptance).

To discuss possible ethical, transparency, or autonomy issues related to the implementation of digital nudges in the area of organizational knowledge and strategic application.

To suggest a framework of the effectiveness of nudging interventions in a KM-foresight environment, one uses interface changes as a predictor of strategic outcomes (e.g., the frequency of early-warning detection, time-to-action, and uptake in a planning document).

Research Questions



According to those objectives, the main research questions that will be considered during the study are:

RQ1: What are the most effective digital nudges that can surfacing foresight and early-warning information in organizational KM systems?

RQ2: Does foresight / early-warning content/ digital nudging usage result in an increase in decentralizing the frequency and timeliness of user interactions with digital nudging?

RQ3: Do there exist any medium to long term observed improvements in engagement with foresight content or do the effects wear out?

RQ4: What are the perceptions of users toward digital nudging within internal organizational KM (namely, in trust, perceived usefulness, transparency, and taking actions of nudged information)?

RQ5: What ethical or legitimacy issues emerge in relation to implementing nudges to the strategic knowledge settings, both in respect to the users and organizational stakeholders?

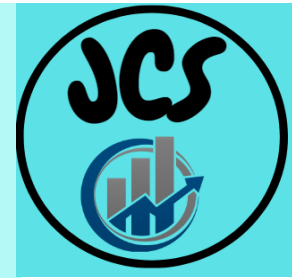
RQ6: Which casual signs and measures of evaluation prove digital-nudge measures in KM platforms to significant foresight and strategic results?

Significance of the Study

The proposed study will be a welcome contribution to the academic theory as well as to practice in organizations. To discuss the implementation of digital nudging into knowledge-management (KM) systems to enhance foresight and early-warning, the study fills an obvious gap of empirical knowledge. Despite a large amount of literature regarding digital nudging in relation to the consumer- and the public-facing online realm (e.g., contexts that require online decision-making, online shopping, or any other behavior change), there is a dearth of solid evidence that can be used on the issue of how such interventions can work under more complex and internal organizational conditions (Weinmann, Schneider and vom Brocke, 2016). This work will contextualize the digital nudge research by offering a broader area of research with larger stakes and a concern user behavior based not on individual interests only but on an organizational position, role, and long-term planning requirements.

Second, the results of the study can be practically applied to the organizational resilience and strategic agility. I would ensure that organizations are able to respond proactively by identifying signs of change very early in order to emerge healthy and still survive in the current environment that is characterized by rapid change in technology as well as volatile market forces and unforeseen disruptions (Rohrbeck and Kum, 2018). Should the application of digital nudging become an effective intervening mechanism in the value addition and consumption of foresight and early-warning content, KM platforms can be potentially not only passive sites of knowledge but also active environments of strategic preparedness. This may enhance organizational ability to foresee threats, utilize arising chances and adaptability to vary situations - which is part of long-term sustainability and competitive edge.

Third, the assessment of the user dimension such as trust, transparency, usability, and ethical acceptability perceptions provides valuable information on human-technology interaction in strategic decision-support systems. Numerous KM and foresight projects cannot succeed due to bad data, but the fact that they were poorly engaged or adopted by the employees (Battistella, De Toni & Pessot, 2021). Through examining the responses of the intended users to the nudges, this research will assist in determining the designs of the nudges which are effective as well as



acceptable and legitimate in the eyes of the employees. That increases the likelihood of practical implementation and eventual success of foresight systems.

Fourth, regarding the methodological position, the study can offer an evaluation framework and metrics connecting interventions on the interface level (nudges) to strategic interventions on the high level (e.g., the acceleration of detection of weak signals, incorporation of the forecast into formal planning, better timeliness in making strategic decisions). These frameworks are so far uncommon, due to the lack of nudging literature that considers long-term organizational performance as reflected in long-term, behavioral proxies at individual, short-term levels (clicks, choices). This may mean that the introduction of strict design and evaluation methods in KM-foresight situations would then offer a template on how future empirical studies are done in the new field.

Lastly, this research would create interdisciplinary dialogue through a blend of components of behavioral design, information systems and strategic management. The digital nudging/KM/foresight/early-warning/systems intersection has not been thoroughly addressed, yet the proof that it is possible and an overview of its advantages may trigger more research - in other industries, disparities, and cultural contexts, thereby adding to the body of research and educating the world.

Literature Review

Knowledge Management (KM) is very crucial in organizational decision-making especially in situations that involve foresight, strategic planning and early warning mechanisms. KM can be used successfully by identifying, acquiring, distributing, and utilizing knowledge in an organization to improve the quality of decision-making and performance in an organization (Alavi and Leidner, 2001). Organizations in high-velocity settings need to identify weak signals and emergent trends and outpace mannerist risks and threats as well as opportunities. Nevertheless, the amount of information inundating human mind and insufficient human attention tend to be an obstacle to timely acquisition and deployment of the essential knowledge, imposing a discrepancy amidst knowledge accessibility and actionable information (Eppler and Mengis, 2004).

Digital nudging, a behavioral economics concept applied to the digital environment, involves pushing user behavior through the interface design and choice architecture, which do not limit the control over the choice (Weinmann, Schneider, and vom Brocke, 2016). E-commerce and health-related digital interventions are well-researched, but its implementation in organizational KM systems has not been developed. Existing sources suggest a promising, yet poorly studied field of research, specifically how digital nudges can facilitate better attention, engagement, and use of foresight and early-warning knowledge in organizations.

Conceptual Relationships and Variables of the study

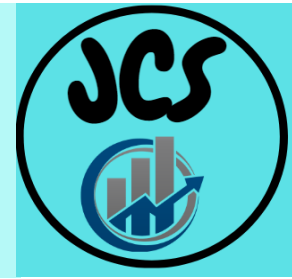
The variables that are important in this study are:

Independent Variable (IV): Digital Nudging (DN).

Mediatizing Variable (MV): Knowledge Management Engagement (KME)

Dependent Variable (DV): Organizational Foresight /Strategic Planning Effectiveness (OF/ SPE)

Moderating Variable (MoV): MoV will be user perceptions, trust and ethical considerations (T/E)



KM Engagement and Digital Nudging

Digital nudging can be defined as the nuanced design elements in digital contexts, which influence user attention and decision-making and behavior in ways that the content developer considers desirable (Weinmann et al., 2016). Some of the most popular nudges are default settings, framing of information, its visual highness, reminders, and social cues. Mirsch, Lehrer, and Jung (2017) observe that digital nudges have the capacity of enhancing relevancy of vital information, minimizing mental load, and inducing more frequent inclinations to digital content.

Nudges in the case of KM can emphasize important reports or give precedence to weak signals, or encourage the user to synthesize knowledge. As an illustration, visual attention to new reports of foresight can enhance the awareness and retrieval of users, whereas social proof messages (e.g., X peers watched this report) are capable of provoking a desire to discuss and share knowledge (Meske and Potthoff, 2017). In digital learning and enterprise systems research, it is demonstrated that nudges may lead to the increased engagement with the content, especially when it is both difficult and cumbersome (Ge et al., 2025; Mirsch et al., 2017).

H1: Digital nudging has a positive effect on knowledge management engagement.

Rationale Nudges facilitate focusing on important content and enhance the chances of knowledge retrieval and use (Weinmann et al., 2016; Meske and Potthoff, 2017).

KM Foresight/Strategic Planning Effectiveness and Engagement

Interaction with KM systems is a requirement to be able to have efficient foresight and strategic decisions. According to organizational research, knowledge use, transfer, and implementation have a direct influence on the quality of strategic planning and responding to early-warnings (Rohrbeck and Kum, 2018). High involvement levels make sure the weak signals are observed, reviewed and integrated in organization strategy and shorten the time gap between occurrences in the environment and organizational action.

The empirical data provided by corporate foresight research indicates that companies that have a greater KM involvement notice the development trends earlier and incorporate them efficiently into the strategic planning, which leads to greater preparedness and competitive advantage (Rohrbeck and Kum, 2018; Battistella, De Toni and Pessot, 2021). Thus, the KM involvement acts as an intermediary between the digital nudging and organizational foresight results.

H2: The degree of knowledge management engagement has a positive impact on the level of organizational foresight and effectiveness of strategic planning.

Reason: The more dedicated KM users are, the higher the chances of detecting, disseminating and taking essential foresight information (Rohrbeck and Kum, 2018).

H3: Knowledge management engagement would mediate between digital nudging and effectiveness of organizational foresight/strategic planning.

Reason: Nudges promote the engagement of KM, consequently, strategic outcomes at the organizational level (Weinmann et al., 2016; Mirsch et al., 2017).

Moderating Role of Trust, Ethics and User Perception

Digital nudging can be successfully implemented, depending on how people will perceive transparency, trust, and ethical considerations. Nudging in the workplace can always be viewed as



manipulative or coercive behavior, which results in resistance, disengagement, or lack of trust (Ruehle, 2023). During KM systems, trust is especially essential because sensitive information and strategic intelligence is dealt with by users.

User adaptability and efficiency of nudges have been reported to be improved through ethical nudging which includes transparency, the ability to opt out, and providing a clear explanation of nudges (Ruehle, 2023; Weinmann et al., 2016). Therefore, the efficacy of digital nudges on KM interaction and future strategic behaviors gets moderated by trust and ethical concerns.

H4: Trust and ethical perception mediate the relationship between digital nudging and KM engagement in which increased trust enhances the mediation.

Rationale: Nudges that are made transparent with adequate ethical rationales have higher chances of acceptance and action (Ruehle, 2023).

H5: Trust and perception of ethics positively mediate the effect of digital nudging on the organizational foresight/strategic planning effectiveness through KM engagement.

Rationale: Ethical and trust-worthy nudges boost the mediating impact of KM engagement, which leads to the improvement of strategic outcomes.

Empirical Data on Nudging, KM, and Strategy Performance

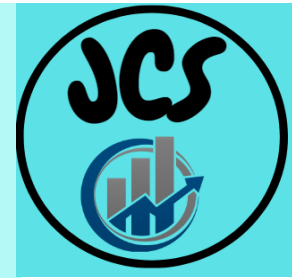
Health, e-commerce, and learning environment studies have repeatedly shown that digital nudges can have an impact on behavior with both a conditional and context-specific manner (Ge et al., 2025). Nevertheless, there is scanty literature that pays particular attention to the issue of organizational KM and foresight. They suggest that nudges in enterprise systems can enhance the rate of adoption and knowledge retrieval, although little longitudinal research has been conducted to tie nudges to organizational-level outcomes (Meske and Potthoff, 2017).

Indirect support to these relationships is demonstrated in the research on corporate foresight. Rohrbeck and Kum (2018) realized that companies that have well-designed KM and early-warning procedures perform better than their rivals in terms of identifying changes in the market and changing tactical information. Adding the findings of digital nudging literature to the studies of corporate foresight, a definite conceptual framework becomes apparent: digital nudges lead into greater engagement with KM which helps to mediate the organizational foresight effectiveness but is contingent upon the perception of trust and ethics by users.

Integrated theoretical foundation

The model examines the role of digital nudging in the knowledge-management (KM) systems in influencing detection and utilization of foresight/early-warning knowledge that will then, affect organizational strategic responsiveness. There are no single theories that can explain all the relevant mechanisms. Choice-architecture / nudge theory should be combined with the Unified Theory of Acceptance and Use of Technology (UTAUT) to create a more comprehensive theoretical basis.

Digital nudging The digital nudging theory states that the user attention and behavior in digital systems can be influenced by the interface design and choice architecture and guide the choice without limiting the freedom of choice (e.g., using defaults, visual cues, framing, or ordering to make preferred options more visible) in the digital interface (Weinmann, Schneider, and vom Brocke, 2016). This theory will particularly be suitable in explicating micro-level, immediate



behavior effects like the act of noticing a new foresight alert or clicking on a weak-signal report. Due to the growing digitalization of KM platforms, their data-driven and interface-driven nature, nudging can be discussed as a theoretically valid way of influencing the attentional and actionable process at the interaction point (Weinmann et al., 2016).

Nevertheless, in organizational contexts, continued strategic effects are reliant on continued adoption, frequent utilization, social and organizational endorsement, and perceived usefulness; however not a single clicks or primary attention. The processes are described by the UTAUT model which supports the model using constructs like performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh, Morris, Davis, and Davis, 2003). These constructs assist in explaining why a user may adopt the KM system in the long run, incorporate it into the working process, disclose foresight wisdom to fellow users, and use it to make decisions. UTAUT therefore embodies the macro-level, social and organisational conditions under which first interface based prompts can either or may be converted into meaningful and sustained use.

Thus, it is not a superficial merger but a stratified, complementary conceptual fusion nudging attends to the immediate behavioral inducement (attention/action), and UTAUT to adoption and continued practice in the context of the organizational set ups. This stratified combination is critical to the answer of how the interface design may eventually result in efficacy of strategic foresight in the KM situations.

How the integration works

Using the integrated framework, there are three interconnected layers which are in practice:

Interaction / Attention Layer (Nudge Theory):

Occurring at this level, digital nudges within the KM interface make users pay attention to: highlighting a new risk, receiving defaults notifications (or receiving horizon-scanning updates), the top-ranking documents on the list of weak-signals, etc. get attention and minimize cognitive load. These design clues will increase the chances of the users opening, reading or flagging content that are relevant. This game corresponds to the major logic of the nudge/choice-architecture theory (Weinmann et al., 2016).

Adoption & Sustained Use Layer (UTAUT):

It is after gaining attention that there are perceptions of the users and the social/ organizational context that determine the possibility of having sustained use of KM. When users think that the KM system can enhance their performance (performance expectancy), is user friendly (effort expectancy), colleagues and leadership support (social influence) and facilitated by the infrastructure or organizational processes (facilitating conditions), then they are more inclined to incorporate regular usage into their practices (Venkatesh et al., 2003).

Outcome Layer:

Organizational forewarnings and foresight become more pronounced through the fusion of repeated contact and embeddedness within the organization and are communicated, discussed, acted upon more, which makes the organization more sensitive to change at an early stage and



enhance its responsiveness to changes in a strategic manner. This fulfills the cause and effect channel between interface design and strategic preparedness.

Besides, the perceived transparency, trust in system design and perceived ethical legitimacy of nudges can mediate the effectiveness of nudging between layers: perceived ethical legitimacy of nudges might cause acceptance of the nudges, comfort in acting on those nudges and may lead to sustained use (ethical dimension related to UTAUT social influence and facilitating condition).

Theory in Practice

The application of this comprehensive approach informs designing, as well as assessment of a nudge-based foresight KM system:

Nudge design:

Meticulously design interface functionality to bring weak signals to notice or risk warnings, to establish helpful default settings, to remind of the benefit of foresight updates by prompts or indicators (suggested social proof), to nudge on the attention to strategic knowledge.

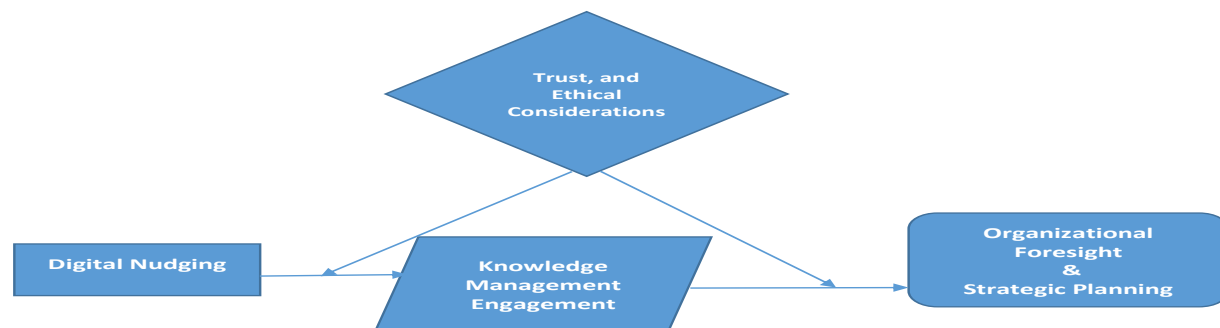
Evaluation Strategy:

Immediate results (e.g. views, clicks, flags, downloads) to assess the impact of nudge, user perceptions (i.e. by survey) (performance expectancy, ease-of-use, social influence, facilitating conditions, perceived transparency/trust) and long-term usage logs and repeat interactions over weeks/months, downstream organisational outcomes (e.g. how often early warnings have been acted upon, foresight has been incorporated into strategic plans, timing of responses).

Hypothesis Testing:

Operationalize the model to consume the following direct, mediation, moderation, and ultimate effect of a nudge on the outcome of organizational foresight: nudge - user behavior, nudge - use/adoption - sustained KM engagement, nudge - transparency/trust, and nudge - outcome moderation, and ultimate impact.

Theoretical framework



Hypotheses Summary

H 1: DN - KME (Direct effect of nudges on engagement)

H2: KME -OF/ SPE (The direct influence of KM involvement on the strategic outcomes)

H3: DN - KME - OF/SPE (Nudging by the means of KM engagement)



H4: T/E intervenes in DN - KME (Moderating effect of trust and ethics in engagement)

H5: T/E mediates (Moderated mediation effect) between DN - KME - OF/SPE.

Proposed Methodology

Research method is defined as systemic set of operations, philosophical postulations and analytical approaches applied in studying a research problem (Saunders, Lewis, and Thornhill, 2019). Effectively designed methodology helps in making the study rigorous, reliable, and coherent with the theoretical underpinnings of the study. Given the fact that this research questions the role of digital nudging on user engagement, user acceptance of technology, and strategic-foresight within knowledge-management (KM) settings, quantitative research design is necessary to test the proposed relationships in a hypothesized manner. Following the Research Onion modified by Saunders, the sections below will discern the research philosophy, approach, strategy, methodological choice, time horizon, population, sampling, data collection, and analytical methods.

Research Philosophy

The research follows pragmatist research philosophy, meaning that it tends to focus on problem-solving and address the research questions using the methods that would be the most appropriate (Saunders et al., 2019). The purpose of assessing digital nudging interventions to KM systems and identifying which design mechanisms enhance levels of foresight and strategic responsiveness can be well aligned to pragmatism. The philosophy facilitates objective measurement and recognizes the contextual realities of using organizational technology.

Research Approach

It has a deductive research methodology. Deduction is the process of making hypotheses based on the existing theories and then proving them by using empirical evidence (Saunders et al., 2019). Because the conceptual model of the study is based on Digital Nudging Theory (Weinmann, Schneider, and vom Brocke, 2016) and the Unified Theory of Acceptance and Use of Technology (UTAUT), (Venkatesh et al., 2003), the hypotheses are tested on the presence of the nudges in the user behavior, perceived usefulness and the expectation of effort and engagement through the analysis of quantitative data.

Methodological Choice

This paper follows the Research Onion; the design is a quantitative study with a mono-method. This option is suitable as the research aims are geared towards the statistical testing of the relationships between the variables, quantifying changes in behaviour, and the empirical test of hypotheses based on theory. Quantitative designs enable precision, generalizability as well as strong statistical modelling (Hair et al., 2021).

Research Strategy

The log data of the surveys is quasi-experimental, and the survey strategy is based on it. According to Saunders et al. (2019), surveys can be helpful in acquiring uniform reactions to a sizable sample of questions when assessing behavioral impetuses within the organization.



The quasi-experimental aspect will be created through the fact that the digital nudges will be implemented in the KM system, and the behavior data (e.g. click rates, the number of alerts made, the number of hours spent in foresight dashboards) will be collected before and after nudges implementation. Even though complete randomization cannot be achieved in the organizational context, it is possible to conduct studies through quasi-experiments that examine the effects of interventions (Hair et al., 2021).

Time Horizon

The research has a longitudinal time horizon, which is explained by Saunders et al. (2019). To carry out evaluation of digital nudging, behavior should be observed over a period of time to identify whether behavioral changes in the beginning are being sustained. The system logs will be gathered within a specified interval just before the intervention and after the intervention (e.g., 4-12 weeks).

Target Population and Sampling.

Target Population

Target group will be comprised of organizational personnel that actively deploy KM systems, foresight dashboards, risk-monitoring or early-warning systems. This involves and not restricted to:

Strategic planners

Risk analysts

Knowledge-management officers

Policy officers

Decision-support analysts

Managers worked with technology-facilitated planning activities.

This group is also of immediate importance since they are the ones who are in close contact with digital information systems and they are likely to react to the nudging interventions that are incorporated into foresight tools.

Sampling Technique

The researchers employ a purposive sampling approach to select the participants answering the pre-determined criteria that is, individuals participating in and utilizing the KM/foresight platform at least once per week. According to Saunders et al. (2019), purposive sampling should be used in a situation that requires the sample to be an expression of experience and interaction with the system to be studied.

Sample Size

To have a statistically valid quantitative study using PLS-SEM, it is always advisable to have a minimum of 150-300 respondents in order to have a robust path modelling (Hair et al., 2021). At least 250 participants will be targeted in the study.



Data Collection Methods

7.1 Survey Instrument

The intended online questionnaire will be used to collect primary data to the target population with the help of a structured questionnaire.

Data Analysis Procedures

The data will be evaluated by the means of the Partial Least Squares Structural Equation Modelling (PLS-SEM) with the help of the SmartPLS or WarpPLS. PLS-SEM should be used when the models are very complex, have a prediction interest, and require a test of both perceptual and behavioral constructs (Hair et al., 2021).

Conclusion of the Study

The proposed research will investigate the power of digital nudging in contributing to knowledge management (KM) processes that facilitate strategic thought, effectively warning, and planning to the organization, and create a model that can be later addressed in an empirical research study and deeper statistical analysis. The literature background indicates that the KM systems are having foundational roles in facilitating the organizations to sense emergent risks, harness joint intelligence and facilitate proactive decision-making. Nonetheless, there is a problem with weak signal detection, timely use of knowledge, as well as constant strategic focus. Digital nudging has been proposed as a potentially effective method to positively alter the decision outcome of users in a variety of digital settings, as subtle cues that do not limit choice but rather facilitate it, namely digital nudging (Weinmann, Schneider and vom Brocke, 2016).

It has also been observed in the literature review that the strategically relevant knowledge is disregarded by the organizational actors as a result of complex interface, overload of choice and misaligned attention structure (Eppler and Mengis, 2004). Due to the timeliness of the sense-making processes and the practice of collective involvement, digital nudges can be behavioral facilitators that can assist employees towards identifying weak signals, focusing on pertinent knowledge, and responding to early warning. Besides, ethical factors including transparency, trust, and autonomy are mentioned to be necessary in cases when nudges are used in workplace settings (Ruehle, 2023). That way, the paper places digital nudging as one of the behavioral improvement tactics in KM systems that assist with foresight capabilities.

There are no single theories that can explain all the relevant mechanisms. Choice-architecture / nudge theory should be combined with the Unified Theory of Acceptance and Use of Technology (UTAUT) to create a more comprehensive theoretical basis. The combination of these theories implies that digital nudges would enhance how knowledge resources are used behaviorally, and hence the abilities of foresight and early warning. It is a combination based on this theory that informs variables and hypotheses of the study, linking digital nudging with knowledge acquisition, sharing, application and, ultimately, organizational outcomes that are driven by foresight.

The approach suggested is based on the Saunders Research Onion that assumes a positivist philosophical perspective and a deductive research paradigm that is suitable when testing a hypothesis (Saunders, Lewis and Thornhill, 2019). Since the aim of the study is to test causal relationships between the constructs, an approach of a quantitative survey is suggested. The study



will adopt cross-sectional research design and structured questionnaires as the major primary data collection methods. Its target audience is managers, analysts and employees with high level of skills in areas that require forecasting, risk management and strategic planning; that is, IT companies, financial organizations, telecommunications firms, public-sector strategic planning departments and research-based organizations. These profiles constitute the natural users of KM systems and they have a direct involvement in decoding the strategic signals and the flows of organizational knowledge.

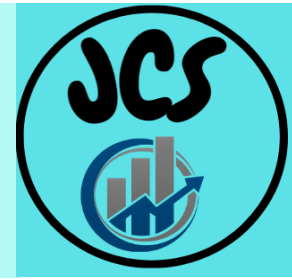
Scales to be used to measure will be validated items based on prior research, and they are going to be reliable and construct valid. Structural Equations Modeling (SEM) will also be utilized as a method to test direct, indirect and mediation effect. This approach is consistent with best practice in testing the theoretically-based models, and understanding the underlying complex behavioral processes in the organizational research.

Implications of the study

This suggested research has great implications on theory, practice, research methodology and within the realm of knowledge management, digital behavior designs and strategic foresight. In principle, by adopting the Nudge Theory (Thaler and Sunstein, 2008) and applying it to the Knowledge-Based View (Grant, 1996), the research contributes to a new theoretical framework, according to which the information of a digital interface can help in improving the utilization of organizational knowledge properties. This addition adds to the existing literature on knowledge management by placing digital nudging as an action that can enhance knowledge acquisition, sharing, and use, as behaviors that are the cornerstone of effective foresight and early-warning systems. It is also relevant to behavior science in that it uses the ideas of nudging to the internal organizational environment, but not consumer settings, a field where few empirical studies have been done.

In practice, the research study provides a useful contribution to the managers, system designers and policy makers who should implement knowledge management platforms, decision support systems, and organizational foresight functions. In case the hypotheses are available in subsequent empirical testing, digital nudging may be used as a low-cost, scalable intervention to aid employee interest in strategically-relevant knowledge. To help organizations overcome information overload, weak signal detection, inconsistent user performance, and other challenges, nudges (prompts, prioritization cues, reminder, and indicator of social proof) could be used to increase their vigilance to important information. These Technologies can provide direct strategic preparedness, risk anticipation and decision quality. Also, the research indicates the significance of transparency and ethics in workplace nudging, as it would encourage organizations to create interventions that follow the autonomy and trust principles and reduce the risks of potential manipulation issues.

Methodologically, the study is a valuable addition of a structured effective model that can inform future researchers in the measurement of the behavioral impact of digital nudges in KM systems. The study presents an excellent basis to evaluate intricate mediation pathways because the researchers propose validated scales, deductive research design, and Structural Equation Modeling. This method could assist future researchers to overcome the existing shortcomings of



the research on digital nudging, in many studies, scholars have used short-term studies instead of systematic observations of the results of these strategies implemented at an organizational level.

Future Research Directions

This proposed model presents a number of avenues that may be followed by future researchers who are interested in extending and empirically endorsing the model. To begin with, future research needs to perform massive quantitative studies at various areas: finance, medical, governmental and technology, to challenge the generality of the model. Owing to the fact that strategic foresight and early-warning functions differ across industries, comparative research can identify contextual moderators of strategic foresight, including organizational culture, uncertainty, or turbulence in the environment.

Second, the research in the future can include experimental or quasi-experimental designs to investigate the causal effect of the types of the nudge-salience enhancement, social norm-based, or personalization type on various KM behavior. Although the research proposed implies the quantitative design based on a cross-section, the experimental designs may provide better causation and assist in determining the types of nudges that generate the most significant boost in signal recognition, knowledge use, and strategic responsiveness.

Third, longitudinal research might be required to investigate the sustainability of effects of nudging. Due to the fact that foresight and early-warning performance can be based on persistent behavioral involvement, future researchers need to experiment the duration of nudging effects and user desensitization or habituation to nudges. Such insights would be important in the design of adaptive or dynamic nudging systems in KM platforms.

Fourth, the exploratory research could combine the advanced analytics and digital trace data instead of using the self-reported surveys only. The objective indicators of behavioral change can be provided by data logs in KM systems, attention indicators and patterns of user interactions, thus increasing accuracy and lowering measurement bias. Improving the validity of the model can be even achieved by combining the survey-based SEM with behavioral data analytics.

Fifth, despite the use of ethical transparency in the present study, further studies can explore the ethical and psychological limits of workplace nudging. The issues of autonomy, trust, perceived manipulation, and fairness should be examined more thoroughly, with the introduction of more digital interventions into organizations. Knowing how users perceive the nudges as acceptable may guide the enhancement of the ethical code to be used in the application of the nudges in knowledge-intensive settings.

Last but not the least, additional studies on the future must consider possible expansions of the model with the inclusion of moderators like digital literacy, cognitive load, organizational support, or technological readiness. These factors can affect the reactions of employees to the nudges and the extent to which the former change knowledge behaviors into the strategic foresight results. These extensions could allow developing a more detailed theory of digitally affected knowledge behavior.

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