

# Propositions towards the Impact of Moral Values in Information System Design on Information System Success Depicted by the DeLone & McLean Information System Success Model

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**Abstract:** This paper develops six propositions concerning the impact of moral values in information system design (MVISD) on information system (IS) success by utilizing the IS Success model of DeLone and McLean (DMISSM). The propositions are grounded on moral objectives identified in MVISD design literature and their conjunctions with DMISSM dimensions. An overview of related literature and an explication of the identified research gap are provided beforehand. New research opportunities emerging from the findings of this paper are outlined at the end.

## 1 INTRODUCTION

To begin with, the following quote is an exemplary motivational statement for this work:

“Our moral imperative is clear. We must insure that information technology, and the information it handles, are used to enhance the dignity of mankind.” (Mason, 1986, p. 11)

The here-cited opinion paper by Mason initiated a novel morality and ethics dimension in Information Systems (IS) Research, which implicitly gained more attention (Stahl, 2012). Mason (1986) identified four moral issues in regards of IS: privacy, accuracy, property and access (PAPA). Looking at current political and societal debates, these moral issues have not vanished in our modern age of digital transformation but have rather become a major topic of concern in the consideration of morally appropriate solutions. For this reason, Laudon and Laudon (2017) introduced a model of five moral dimensions of the information age which reached out to the basics of IS education as part of a students’ text book: “information rights and obligations”, “property rights and obligations”, “accountability and control”, “System Quality” and “quality of life”. This example indicates that moral values in information system development (MVISD) are not only of academic interest, but are also dealt with by educators and practitioners.

On the other hand, organizations are setting a special focus on investing into the development, implementation and operation of successful IS (DeLone & McLean, 2016). With growing demand for sophisticated, yet individual solutions, those information environments tend to become larger and more networked in terms of their components’ quantity and complexity of relationships (Courtney et al., 2008). Conjunctions between IS Success and other concepts, from IS- and non-IS-domains, have thus become more diverse as well (Urbach & Müller, 2012).

This paper investigates in which way MVISD can impact IS Success and thereby possibly affect the overall impact of IS in an organization. The aim is to contribute to a general understanding of relationships between MVISD and IS Success by formulating propositions of MVISD impact towards IS Success entities of the DeLone and McLean (2003) IS Success model (DMISSM).

## 2 RELATED WORK

In favour of the the aim of this paper and to provide a basis for the discussion of potential research gaps, this section provides an overview of existing literature and state-of-the-art knowledge concerning IS Success, specifically the DMISSM, and MVISD.

## 2.1 Description of the Literature Search

A literature review was carried out using scientific literature databases and search engines such as AIS e-library, ACM Digital Library or IEEE Explore to receive an overview of yet-conducted work on the present topic. The review followed recommendations for conducting literature reviews by Snyder (2019).

Search terms aimed at two different research directions. The following terms were used separately or combined: (1) "Information System Success", "DeLone McLean Model"; (2) "Moral", "Information System", "Moral Values", "Information System Design", "Information System Development". The performed search resulted in more than 500.000 found documents. The results were sorted by relevancy. Titles and abstracts of the first 30 entries per search outcome were scanned.

From a first selection, 47 sources were identified as relevant to the purpose of this paper. Moreover, backward and forward searches were included to receive a complete picture on certain aspects, resulting in 60 papers to be inspected. In a second review cycle, papers were dropped due to yet-unnoted irrelevancy, redundancy or if they considered too early stages of work in progress. Finally, 25 sources were included in both parts of this review.

## 2.2 DeLone and Mclean Information System Success Model

Research on IS Success, investigating the effective creation, distribution and use of information via technology, has become a fast-growing scientific discipline, which holds a vast amount of papers and has been addressed in manifold ways by a large number of authors (Petter et al., 2012). Therefore, substantial insights could be gained from the investigation of yet-conducted literature reviews. In reviewing literature, authors share the observation that a large number of authors based their research on the Information System Success Model of DeLone and McLean (1992) and its updated version of 2003 (DeLone & McLean, 2003) and see it as the probably most influential IS Success model in the IS research community (Agourram & Ingham, 2007; Iivari, 2005; Urbach & Müller, 2012; Urbach et al., 2009; Visser et al., 2012). Therefore, the components of this model will be briefly introduced in this section.

In the DMISSM of 1992, "System Quality" and "Information Quality" are separately and jointly affecting the information system "Use" and "User Satisfaction". The amount of "Use" can subsequently

have positive or negative effects on "User Satisfaction" and vice versa. The overall "System Use" results in an "Individual Impact" for the user, which finally leads to an "Organizational Impact". DeLone and McLean (1992) reviewed literature on each of the suggested components. It was found that "System Quality" is characterized by reliability, response-time, ease-of-use and other measures of the processing system itself. "Information Quality" includes the output quality of such systems, especially concerning information reports. "Use" describes the frequency, context, impact and other characteristics of the actual use of the information output of the system and can in some contexts also be seen as a measure of system adoption, according to the authors. "User Satisfaction" implicitly describes the response of users to the "Use". DeLone and McLean saw "impact" closely related to the term "performance" and explain that the "Individual Impact" may be reflected for instance by the change of a user's productivity, learning progress, task fulfilment or understanding of the information, while "Organizational Impact" may simultaneously affect the organizational performance in aspects such as decision-making, return on investment or innovations. (DeLone & McLean, 1992).

In an updated version of the model, a new instrument, namely "Service Quality" (Pitt et al., 1995) was introduced by DeLone and McLean (2003) to describe the overall quality which affects "Use" and "User Satisfaction". "Service Quality" focusses on the role of IS as service providers, besides their function as information providers. The three quality instruments are now ascribed to impact on "Intention to use" first, before actual "Use" applies, and impact on "User Satisfaction". Here, "Intention to use" describes an attitude towards the system rather than a behavior, taking into account that "Use" as such may be mandatory or voluntary, informed or uninformed, effective or ineffective. The implicit "Use" of a system still impacts "User Satisfaction" in both a processual and causal sense. "User Satisfaction" itself however feeds back to "Intention to use" in the updated model. Formerly described "Individual Impacts" and "Organizational Impacts" as consequences of System Use are now grouped into a single entity: "Net Benefits". The new term allows for the measurement of individual or organizational benefits and can have different definitions in different contexts, with different stakeholders. Moreover, DeLone and McLean (2003) suggested feedback loops of "Net Benefits" impacting both "Intention to use" and "User Satisfaction", as both positive outcome and lack of benefits could lead to a change

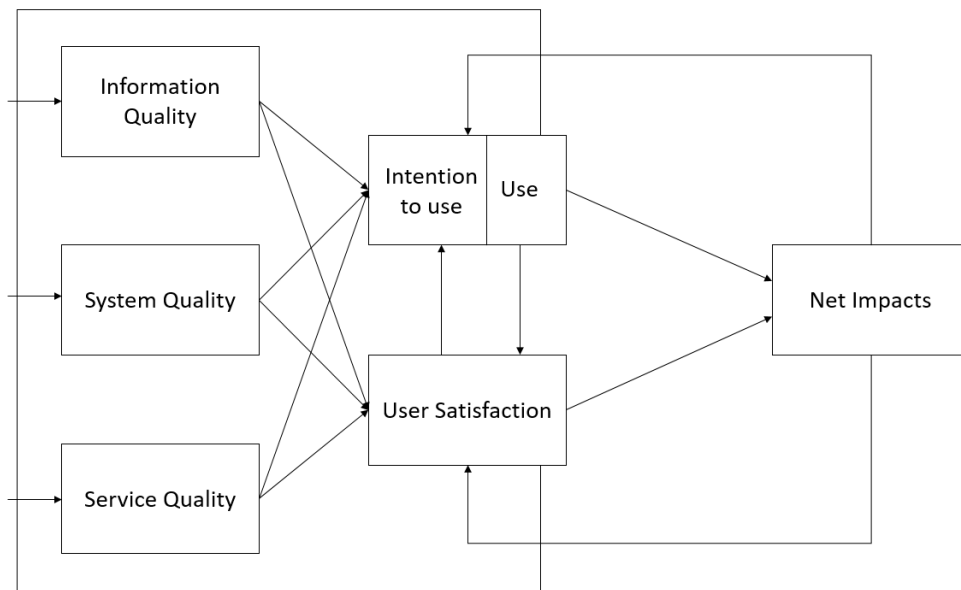


Figure 1: Updated DeLone and McLean (2003) IS Success Model (modified). Own visualization derived from DeLone and McLean (2016, p. 9).

in frequency of use and continuance of the system. More recently, DeLone and McLean (2016) modified the IS Success model of 2003 by renaming “Net Benefits” to “Net Impacts” and adding “maintenance” feedback loops emerging from “Use” and “User Satisfaction”, impacting all three quality dimensions. The modified updated DMISSM is visualized in Figure 1. In the literature reviewed, most authors aimed at enhancing and using existing IS Success models rather than developing a new one, like Cuellar et al. (2006); Lehner et al. (2014); Visser et al. (2012).

Others tested and validated both the models of 1992 (Iivari, 2005) and 2003 (Hu & Wu, 2016). An overall finding was that IS Success, measured with the DMISSM, is mostly seen from the end-user perspective, as it concerns the actual use of the IS and its consequences (Agourram & Ingham, 2007; Hu & Wu, 2016; Twine & Brown, 2011). No papers reviewed saw IS Success models from a developer perspective.

A more thorough and critical meta-review of the DMISSMs was recently conducted by Jeyaraj (2020) in which 53 empirical studies were analyzed with the intention to study the empirical support of IS Success relationships within the DMISSM and updated DMISSM and to develop new research directions. The review attributes a non-uniformity in the application of the DMISSM models to the reviewed state of research and finds that the interrelationships, dimensionality and interdependence of DMISSM model elements remained unspecified and

questionable. For instance, Jeyaraj also highlights the need to investigate “Perceived usefulness”, an antecedent element to “Intention to use” within the renowned Technology Acceptance Model (Davis, 1989), in the context of interchangeability with “Individual impact” in the DMISSM or “Net Benefits” in the updated DMISSM.

In the light of such critical and contradictory aspects that researchers have come up with regarding DeLone and McLean’s work, the objective of this paper should be clarified once more. It is our aim to spark and enhance the scientific and practical discussion around the impact of moral values in IS design on IS Success. In the scope of this work, the DMISSM, as a widely used and empirically supported model (Urbach & Müller, 2012), will serve as a structure of IS Success dimensions which may be linked to MVIDS concepts and help to explore and propose possible implications of such relationships.

### 2.3 Moral Values in the Context of Information System Design

Ethics can be understood as a theory or system of moral values, whereas the term moral focuses on “right” human behavior in terms of its effects on society, persons, or organizations (Larson, 2007). Such moral values lay within the “goodness” of persons and the “goodness” of acts they perform, what makes them distinguishable from technical values which are rather related to skills and personal characteristics (Rosanas & Velilla, 2005).

Stahl (2008, 2012) presents a categorization of normative IS research, using normativity as an umbrella term for ethics, morality and similar concepts, and proposing different levels of normativity applying to IS research on ethics. His normativity levels are (1) moral intuition, (2) explicit morality, (3) ethical theory and (4) meta-ethical reflection, each of which he could identify in existing IS research work (Stahl, 2012, p. 648). During the present review of MVISD-related work, it could be observed that authors indeed derive the relevancy of moral values or the suggestion of IS design (ISD) methodologies from different levels of ethical discussion and analysis, as explained by Stahl. A categorization of this kind will however be waived in this paper, as it would be too far off its original scope.

Key papers reviewed in this section feature their own literature reviews and provide a collection of findings which we will consider as heuristics.

The above-mentioned PAPA paper by Mason (1986) addressed issues connected to IS security, governance and compliance, as in privacy, property and access, as well as Information Quality, as in accuracy. In the literature reviewed, some authors linked similar concepts to a discussion of moral values, but the outcome could not be linked to ISD. For instance, the intention of users to act compliantly to the IS security compliance of an organization has been researched in relationship to severity of punishment and certainty of detection (Ahluwalia & Merhi, 2018; Merhi & Ahluwalia, 2019) but seems to lack any suggestions for an implementation of the findings in system development. Similarly, ethical theory constructs explaining IS misuse were presented, but no implications for IS design or development were given (Al-Omari et al., 2012).

Bell and Adam (2004) reviewed the state of MVISD much earlier and also criticized that much work in the IS domain concerning moral values concentrated on decision-making in ISD, rather than applying a more practical view towards integrating values. Thereby, as the authors discuss, the concept of “good” in IS development methodologies had become a functionalist term, separated from moral values: “It is as if the goodness of ISD methodologies is to be understood in functionalist terms rather than moral terms and further underlines both the apparent separation of ethics from other parts of life and the lesser status of ethics within disciplines.” (Bell & Adam, 2004, p. 7).

While Bell and Adam’s observation may be evident for a certain range of scientific publications at that time, they however neglected an upcoming research trend in the “2000s”-years focusing

specifically on the embodiment of values in IS design (Friedman, 1996; Nissenbaum, 2001), also including moral values (Friedman & Kahn Jr, 2003), and tackling the critical separation of functional and moral values. The value-sensitive design (VSD) approach by Friedman (1996) is an often-cited piece in this context, as it was initially concerned with “user autonomy” (see also Friedman and Nissenbaum (1997)) and “freedom from bias” (see also Nissenbaum (1998)) from a moral values perspective and was later developed into an ISD methodology (Friedman et al., 2006) featuring conceptual, empirical and technical investigations.

The VSD conceptual investigations concern the identification of stakeholders to the design, as well as relevant values, while also considering value trade-offs when competing values apply. Academic publications of related kind had been summarized with reference to common human values often implicated in system design (Friedman et al., 2006, pp. 17-18): “human welfare”, “ownership and property”, “privacy”, “freedom from bias”, “universal usability”, “trust”, “autonomy”, “informed consent”, “accountability”, “courtesy”, “identity”, “calmness”, and “environmental sustainability” (for the latter see also Nathan et al. (2009)). Empirical investigations were included to take into account the human context in which the system design would be implemented. Technical investigations finally consider either the value-compatibility of properties in existing technology, or the proactive value-driven technical design of systems based on values identified during the conceptual investigation.

Following the initial impact, the VSD methodology by Friedman et al. (2006) was criticized for hardly distinguishing between actual moral values and personal preferences or wishes, also lacking a determination of the concept of values at all, not providing stakeholder analysis methods, relying on empirical knowledge in design decisions and lacking a theory for dealing with value trade-offs (Manders-Huits, 2011). Implicitly, Manders-Huits (2011) suggests additional criteria for VSD clearly determining the definition of values and ethical theory to be used, including stakeholder analysis and introducing a values advocate to monitor the design process.

Moreover, Borning and Muller (2012) reviewed the state of papers following the concept of Friedman et al. to this point of time. The authors criticized papers claiming universality for values where there should rather be a consideration of culturally-specific plurality. The same critique applied for lists of values which had been gathered in some cases for heuristic

summaries of values without explicating the specific viewpoint under which they were developed. In addition, they advised to amplify the participants' and researchers' voices in VSD-related work, as it was necessary to clarify the individual value sets potentially biasing such study scenarios. They also suggested further development steps to VSD such as turning towards democratized user participation in design and incorporating additional moral views from research on feminism and post-colonialism. Davis and Nathan (2015) took on the new suggestions and also proposed some guiding questions for the further development of VSD.

Norton et al. (2019) point to the aspiration of new relevant values connected to sustainability, which have gained importance lately. The authors conducted an action research case study with permaculture communities, who are highly sensitive to sustainability. They identified long-term values reasoning the engagement, resistance values to turn away from unsustainable behavior and technology values concerning the conflict with the inherent unsustainability of technologies by nature.

Twenty years after the impact of Friedman et al. (2006), a literature review still outlined methodological obscurities, especially for new researchers in the domain (Winkler & Spiekermann, 2018). Sharing more empirical knowledge about applied VSD was implicitly encouraged. In a recent book publication, Friedman and Hendry (2019) present more explanations on the VSD methodology, also reacting to the formerly uttered critique. For instance, they reason the unclear definition of "human values" and lack of ethical theory with better adaptability of VSD to specific application scenarios, thereby leaving the work of defining these aspects more accurately to the individual researchers. For scholars in moral and normative research like Manders-Huits (2011), this could lead to "dissatisfaction" regarding the underspecified formulation of values (Friedman & Hendry, 2019, p. 24) while they still retain moral and ethical sensibilities. Lately, a novel VSD formative framework was proposed (Hendry et al., 2021) which comprises knowledge from design practice, design theory and provides translation from theory to practice and practice to theory.

The ongoing emergence of new insights to VSD is probably due to an overarching goal of the research discipline to establish value-sensitivity in the minds of IS researchers, so that "focusing design on human values will become an accepted rather than novel perspective" (Davis & Nathan, 2015, p. 35).

Some scientific contributions on MVIDS also document practical MVIDS integration in design processes. For instance, Larson (2007) compared several alternative procedures of MVIDS integration after identifying an ethical gap between ethical dimension, technology, information and participants in an IS. His finally suggested procedure comprises (1) intelligence, which represents problem discovery and definition, (2) design in the sense of identifying and exploring potential solutions, (3) choice of an alternative, and (4) implementation. Moreover, the reports on the RAPUNSEL studies by Flanagan et al. (2005, 2008) set focus on examining a systematic design approach to embodying values in system design. A gamified environment teaching programming skills to girls was to be designed in this case. The designers chose a three-step-approach (2008): (1) discovery of implicit values in a project through reflection, (2) translation of the discovered values through operationalization, implementation and solving or trading-off conflicting values and (3) verification. They draw conclusions on different levels: first, that technologies do inherently embody values and that values in technical systems can be deliberately embodied; second, that they observed "values expressed" in relation to designing the game content and "values materially embodied" related to the acts a person had to perform within the game.

The RAPUNSEL case and the discovery of "materially embodied" values raise the question, whether concepts of user-centered design (Abrams et al., 2004) are interrelated with MVIDS, since Flanagan et al. involved the user perspective in a VSD process. The authors initially stated they did not want to replace methodologies such as user-centered design but wanted to "demonstrate with concrete examples the way in which attention to values in the design process can inform the stages of many existing design processes" (Flanagan et al., 2005, p. 752).

## 2.4 Research Gap

Regarding IS Success, the significance of the DMISSM and updated DMISSM was highlighted in the 2.2 section. The models are adaptive to new components and further development was encouraged (Petter et al., 2012).

As the analysis of Jeyaraj (2020) gives away, several authors have studied antecedents and consequences of IS Success dimensions that constitute of other factors than IS Success components themselves, such as individual characteristics, task characteristics and organizational factors. The list of perspectives for such research

directions, represented by a table of non-IS-Success constructs yet examined with IS Success (Jeyaraj, 2020, p. 9), shows a scarcity of DMISSM model utilization for MVISD examination.

So far, this paper provides a heuristic overview of existing MVISD concepts and the DMISSM in selected literature. The findings allow for proposition development regarding potential relationships of MVISD and IS Success dimensions, depicted by the updated DMISSM. Further literature review work on MVISD literature is concurrently encouraged.

According to our analysis, IS research has not seen a contribution on this specific relationship between MVISD and IS Success before, which highlights the existence of a research gap and undermines the relevancy of addressing it on a conference for researchers and practitioners. To be specific about the gap being tackled, we formulate the following research question (RQ):

How do Moral Values in Information System Design impact Information System Success?

### 3 PROPOSITIONS

For the development of propositions to the RQ, the updated DMISSM will be analyzed regarding components which may be influenced by MVISD aspects. The goal is to envision impacts on specific elements of the DMISSM. DeLone and McLean (2003) emphasized that dependent and independent variables should not be confused when making such suggestions, therefore IS Success will be explicitly used as dependent variable influenced by the independent variable MVISD.

When revising their former IS Success model, DeLone and McLean (2003) reviewed examinations carried out by other authors, finding that the links between the two quality dimensions identified in 1992, as well as “System Use”, and “Individual Impact” were preeminently found significant. Following these findings, the authors summarized how each Quality component and “System Use” were measured. In addition, they adopted the measures examined by Pitt et al. (1995) for “Service Quality”. While far more measures were proposed due to the high number of constructs examined with the DMISSM by researchers in various contexts (DeLone & McLean, 2016; Urbach & Müller, 2012), only the core measures identified in 2003 will serve as potentially connecting characteristics for arguing MVISD to IS Success relationships here. Table 1 lists these enumerated measure concepts relevant for the updated DMISSM. With reference to the idea behind

“Net Benefits” (2003) or “Net Impacts” (2016) of DeLone and McLean, such an entity will not be considered here, because its measures need to be defined according to individual contexts of System Use, which are not specified in this paper.

As Borning and Muller (2012) suggest, allegedly “universal” lists of values in system design may not reflect the whole picture of considerable values in an individual design process after all. Therefore, since no particular ISD scenario is specified in this paper, which would allow for a clearer delimitation, the following discussion of propositions goes without ascribing distinctive moral values to IS Success

Though, to propose impacts towards the DMISSM without creating lists of values to be compared against IS Success measures, the formulation of moral objectives behind MVISD is relevant. Moral objectives, in our terms, describe an information system’s state of criteria to be fulfilled by implementing moral values in ISD processes, which can implicitly be ascribed to IS Success measures. For instance, while “privacy” was identified by some authors as a separate value (Friedman et al., 2006), it was at the same time described as a desirable state of “goodness” only to be achieved by the actual integration of MVISD (Friedman, 1996; Mason, 1986; Nissenbaum, 2001; Stahl, 2012). Therefore, “privacy” is not only considered a human value but also, or even more, a moral objective driven by MVISD. In consequence, regarding IS Success entities, “privacy” could be interpretively ascribed to “assurance” and “reliability” measuring “Service Quality”, as well as “reliability” measuring “System Quality”, because these measures are related to confidentiality and information security. After all, the first proposition can be formulated as follows:

**Proposition 1:** MVISD impact IS Success on a System Quality and Service Quality level, due to moral privacy objectives affecting system reliability and assurance.

It is important to note that these are hypothetical assumptions, which will be used to develop final propositions addressing the RQ. It is up to the research community to present other perspectives leading to different assumptions, and to alter, validate or build upon these propositions and the underlying thoughts.

Continuing with the demonstrated approach, the list of often implicated human values with ethical import by Friedman et al. (2006, pp. 90-91) contains more human values translatable into moral objectives, which are supported by the related literature reviewed. The moral objectives and IS Success

Table 1: Measures of IS Success instruments identified by DeLone and McLean (2003); Pitt et al. (1995).

DMISSM entities	Information Quality	System Quality	Service Quality	System Use (Intention to use, Use and User Satisfaction)
Measures	Accuracy	Integration	Tangibles	Frequency of use
	Timeliness	Ease-of-use	Reliability	Number of accesses
	Completeness	Functionality	Responsiveness	Time of use
	Relevance	Reliability	Assurance	Usage Pattern
	Consistency	Flexibility	Empathy	Dependency
		Data quality		
		Portability		
		Importance		

measures discussed in conjunction will also be summarized in Table 2.

The objective “freedom from bias” refers to the avoidance of discrimination and unfairness evolving from preexisting social or technical bias, thus promoting fairness, equity, equality and social justice (Friedman, 1996; Laudon & Laudon, 2017; Manders-Huits, 2011; Nathan et al., 2009; Nissenbaum, 1998, 2001). These moral values are also entangled with the objectives of “universal usability” and “identity”, promoting all people to be successful users regardless of who they are as an individual or group (Hendry et al., 2021).

The provision of these equal opportunities however also depends on access (Mason, 1986). Within IS Success entities, “integration”, “ease-of-use” and “flexibility” measuring “System Quality” can be affected as well as “responsiveness” and “empathy” measuring “Service Quality”, as differences between users, scenarios of use and individual backgrounds need to be taken into account. Moreover, “timeliness” measuring “Information Quality” may serve these objectives, too, as untimely disclosure of information for certain user groups may affect fairness. Therefore, we derive the second proposition:

**Proposition 2:** MVISD impact IS Success on a System Quality level, as the objectives of freedom from bias, universal usability and identity impact equal user empowerment through integration, ease-of-use and flexibility. Moreover, Service Quality is

impacted by MVISD towards responsiveness and empathy measures. The objectives also impact Information Quality of IS, since equal timeliness of information disclosure for all users demands for consideration.

The moral objectives regarding “trust” and “informed consent” both target the prevention of betrayal by promoting trusted and thorough information disclosure to achieve an informed agreement based on voluntariness and competence. Thereby, access to all relevant information (Mason, 1986) as well as accuracy and quality of the disclosed data (Laudon & Laudon, 2017; Mason, 1986) are important. ISD influenced by these objectives would impact all measures of the “Information Quality” entity and additionally impact “data quality”, “reliability” and “functionality” measures of “System Quality”, as to ensure, for example, system availability and correct data processing. Especially for trust and fair agreement, “assurance” measures of “Service Quality” are impacted, too. Implicitly, the third proposition can be made:

**Proposition 3:** MVISD impact IS Success on an Information Quality level, since the objectives of trust and informed consent affect accuracy, timeliness, completeness, relevance and consistency of the information providing function of IS. Furthermore, trust and informed consent objectives can have an effect on System Quality in terms of data quality, reliability and functionality, besides assurance in Service Quality.

Table 2: Summary of propositions towards impact of MVISD objectives on IS Success entities of the DMISSM.

Prop.	Moral Objective(s)	Derived from	Proposed impact on IS Success			
			Information Quality	System Quality	Service Quality	System Use (Intention to use, Use and User Satisfaction)
1	Privacy	(Friedman, 1996; Mason, 1986; Nissenbaum, 2001; Stahl, 2012)		Reliability	Reliability, Assurance	
2	Freedom from bias, Universal usability, Identity	(Friedman, 1996; Hendry et al., 2021; Laudon & Laudon, 2017; Manders-Huits, 2011; Nathan et al., 2009; Nissenbaum, 1998, 2001)	Timeliness	Integration, Ease-of-use, Flexibility	Responsiveness, Empathy	
3	Trust, Informed consent	(Laudon & Laudon, 2017; Mason, 1986)	Accuracy, Timeliness, Completeness, Relevance, Consistency	Data quality, Reliability, Functionality	Assurance	
4	Information ownership and property rights	(Laudon & Laudon, 2017; Mason, 1986; Stahl, 2012)		Functionality	Tangibles	
5	Autonomy	(Friedman, 1996; Friedman & Kahn Jr, 2003; Friedman & Nissenbaum, 1997)		Importance, Portability, Flexibility		Dependency
6	Environmental sustainability	(Nathan et al., 2009; Norton et al., 2019)		Integration, Reliability	Tangibles, Assurance	Frequency of use, Number of accesses, Time of use, Usage pattern, Dependency

Concerning information rights and obligations, another objective in MVISD concerns “ownership and property” (Laudon & Laudon, 2017; Mason, 1986; Stahl, 2012). Following elaborations on the philosophical roots of ownership concepts (Hart, 2002), foundations of the idea of ownership and property are connected to land and physical objects. Even though information and data are intangible, they

resemble the virtual form of such objects in today’s organizations. Therefore, one can argue the impact of this moral objective on “functionality” in “System Quality” and “tangibles” as a measure of “Service Quality”. Pitt et al. (1995) explain that the “tangibles” measure could in its sense also be split into “appearance” and “hardware/software”. So, for instance, if a moral conflict over ownership claims



would arise in an ISD process, this could affect the availability and quality of system features as “tangible” parts of an IS and consequently impact IS Success negatively. Hence, we make a fourth proposition:

**Proposition 4:** MVIDS impact IS Success on a System Quality and Service Quality level, since moral objectives considering information ownership and property rights can affect a system’s functionality and tangibles.

“User autonomy” is another moral objective supported in MVIDS research, referring to an individual’s ability to autonomously decide, plan and act as they wish to perform a certain task (Friedman, 1996; Friedman & Kahn Jr, 2003; Friedman & Nissenbaum, 1997). In terms of autonomy from place and resources, “portability” and “flexibility” as measures of the “System Quality” can be affected. As autonomy also translates to independency, the impact on the “dependency” measure of “System Use” is apparent. Herein lies a conflictual relationship. A system design which follows the objective of granting most possible autonomy to users, would actually require a lowest possible dependency between System Use and the accomplishment of a task. At the same time, if users were not dependent on the use of a system, “System Use” might decrease and thereby impact “Net Impacts” negatively. In parallel, the “importance” measure of “System Quality” is additionally affected. Investigating the ideal balance between user autonomy and system use could be a matter of future research. Another emerging question would be, whether “intention to use” was capable of keeping “System Use” high regardless of a lacking dependency. After all, the fifth proposition of this paper can be formulated:

**Proposition 5:** MVIDS impact IS Success on a System Quality level in terms of user autonomy objectives, which affects system importance, as well as portability and flexibility as parts of System Quality. Moreover, there is an impact on dependency as an attribute of System Use.

The last identified moral objective in this paper refers to “environmental sustainability”. The moral consideration therein concerns the consequences of acts for our natural ecosystems and future human generations. Moral values were found connected to sustainable innovation (Nathan et al., 2009), sustainability engagement, resistance against unsustainability and considerations of sustainability (Norton et al., 2019). As Flanagan et al. (2008) concluded, values may be technically embodied in

technologies from the start or may be embodied deliberately during design, the latter being divided into values expressed during the design process and values emerging from the acts performed within the system. Therefore, it is claimable that the sustainability objective could impact all measures of “System Use”, since sustainability effects can depend on the purpose, frequency and time of use as well as number of accesses and dependency. For instance, the carbon footprint of video-on-demand systems has become a public moral issue related to environmental sustainability (BMU, 2020). Following these concerns, “System Use” could be directly linked to effects on climate change. In addition, the already inherent sustainability values towards smartphone production are part of the picture. In ISD, these exemplary issues could be considered to minimize the negative effects on intention to use. Consequently, the objective also impacts measures like “tangibles” and environmental sustainability “assurance” within the “Service Quality” component. Furthermore, “System Quality” can be impacted through “integration” and “reliability”, reducing resource-costly maintenance or the need for repair and replacement. Finally, the sixth and last proposition can be presented:

**Proposition 6:** MVIDS impact IS Success by affecting System Use in consideration of environmental sustainability objectives. Besides, the objective impacts tangibles and assurance within Service Quality. There are also effects on System Quality, impacted through environmentally sustainable system integration and reliability.

## 4 CONCLUSION AND OUTLOOK

First of all, this paper identified a research gap between the concept of MVIDS and dimensions of IS Success represented by DMISSMs. Following a large number of contributions towards extending the DMISSMs, this paper initially introduces considerations of moral values as part of information system to the concept of IS Success measurement.

As indicated in regards of the VSD methodology, parts of the IS research community are striving towards a “new normal”, which encompasses human values in ISD with the same naturalness as yet-adopted concepts like user-centered design (Davis & Nathan, 2015), although both concepts may also be interrelated. Considering the importance of IS Success for organizations implementing IS and technology in general (DeLone & McLean, 2016), this input highlights the opportunity for ISD scholars

to further elaborate on the role and relevancy of moral values within success-oriented ISD processes.

Within the boundaries of limitations, this work provides six propositions suggesting that such impacts exist. The implications for organizations using IS may therefore be affected as well. However, at this point, these effects can neither be characterized further nor examined for significance, especially lacking empirical input.

Future research may build upon this paper with further contributions tackling the identified research gap and RQ. It is also considerable to extend the DMISSM by new entities with moral or ethical import, or to extend the VSD methodology by an analysis of implications for IS Success. Moreover, tensions between moral objectives and the aim to increase System Use for an effect on IS net impacts demand for further investigation.

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