

A Theory of User Acceptance of IS Project Management Methodologies: Understanding the Influence of Psychological Determinism and Experience

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ABSTRACT

Despite the overwhelming advantages of using an IS project management methodology, organisations are rarely able to motivate their staff to use them: Consequently, this lack of methodology usage by individuals fails to deliver the expected advantages of better quality, control, less time and effort. We analyse the determinants of an individual's intention to use IS project management methodology in order to enable organisations to engineer those that meet the needs of actual users and are really used by them. Results from an exploratory field study conducted in a service organisation, are used to construct a conceptual model. Based upon this research model, we posit that: a) value of a methodology, b) workgroup influence, c) self-beliefs, d) organisational characteristics, and e) previous habits influence intention to use a methodology. Additionally, we find that the strength of these relationships depends upon the needs of an individual and the degree of prior experience they have in using similar methodology.

General Terms

Management, Human factors, Theory

Keywords

Methodology adoption, Usage, IS project management

1. INTRODUCTION

In the search for ways to arrive at replicable, pragmatic, cost-effective, and timely solutions to real-world problems in systematic and predictable ways [1], organisations either adopt or customise and adaptively apply IS project management (ISPM) methodologies, which consist of tested bodies of methods, rules and procedures. Some of the most fundamental concepts that justify the use of structured methodologies, as identified by Fitzgerald, [2] are: i) they reduce complexity by subdividing the projects development and management process into plausible and coherent steps, ii) they increase transparency and therefore control of the activities, thus reducing risk and uncertainty of projects,

and iii) they provide a goal-oriented framework that helps to direct the application of techniques and resources at appropriate times during the project [2]. Despite the advantages of using an ISPM methodology, only 50% of organisations are actually able to make their staff use such methodologies [3]. In the context of software development, a project survey conducted by Russo et al. [4] showed that only 6% of organisations claim that their methodologies are always used as specified. Cicmil et al. [1] also found that resistance towards the acceptance of project management methodologies is high because the users do not have faith in the concept, fear power loss, or lack adequate training and support from upper management. Organisational theorists have long recognised that behavioural resistance of individuals against the use of new methodologies is because they might not share the goals of the organisations in which they work, and that exerts pressure on them to use the new methodologies [5]. As such, the roots of lacking methodology acceptance, lies – among other factors – in the failure to understand the attitudes of individuals towards using a methodology. This lack of understanding ultimately leads to the development and implementation of ISPM methodologies that might be considered unsuitable, and are as a result rejected by individuals [6].

In the past, research projects attempted to analyse only a few of the above-mentioned problems. These projects focused on cognitive user decision-making in narrow and specific organisational contexts (mostly in the field of software engineering). However, these research projects have not provided any concrete answers [7]. Some studies have also attempted to examine usage behaviour of individuals regarding IS methodologies from a technology adoption perspective. They view software development methodologies as technology innovations, and make use of Diffusion of Innovations Theory (DOI) and the Technology Acceptance Model (TAM) (for e.g. [8,9]). Strikingly, our literature review revealed that none of the studies conducted in the past attempted to examine the effect of individual's automatic behaviour (e.g. habits and emotions) in the context of methodology usage. Research has also not attempted to understand the effect of individual users' deep-rooted personal characteristics and traits, such as their needs, expectancies, age and gender. The expenditure of time and effort in developing and implementing ISPM methodologies makes this a critical area of IS concern [8]. This leads us to some fundamental questions regarding the use of methodologies, which this study attempts to answer:

- a) What are the determinants of an individual’s decision to accept and use an ISPM methodology?
- b) How do basic needs of individuals and other contextual factors such as methodology experience influence the predictive power of the different determinants of ISPM methodology acceptance?

Our study is a step toward filling the gap in the ISPM evaluation, development and adoption literature, which till now has not developed a theoretically and practically complete and relevant understanding of the determinants that influence the acceptance of ISPM methodologies, and has also not studied the effect of personal traits such as needs. We heed the call of Pfleeger [10], who appeals that the field of MIS needs to better understand the role of people in the adoption process, drawing upon social science models as appropriate to further this understanding [9]. We have identified needs theories – e.g. Maslow’s hierarchy of needs theory [11] and Murray’s theory of psychogenic needs [12] – that help us understand how, when and which specific needs are more important to people, and the social science model of Triandis’ Theory of Interpersonal Behaviour (TTIB) [13], to provide a comprehensive theoretical basis for analysing the aforementioned research questions.

The remainder of this *research-in-progress* paper is organised as follows: In section 2 we discuss the foundations, which aids the reader’s understanding of the context of our research. We discuss prior research on the topic in order to clarify what has been done and what needs to be done. In section 3 we provide an overview of the methods we use, and why we use them. Section 4 explains the basic theoretical concepts that provide the framework for our conceptual model. We present our research model and hypotheses, pointing out validated survey instruments that might be used to operationalise the underlying constructs in the next phase of our research (which involves testing the proposed model). In Section 5, we discuss limitations of the study and outline the next steps in the course of our research. To conclude, in section 6, we discuss the implications and contributions of our study.

2. FOUNDATIONS

In our research, we focus on examining the behaviour of *individual users* of a methodology instead of an organisation because, although a particular ISPM methodology is developed and implemented by an organisation, the extent of its use is usually determined by the actual users of the methodology [9,14]. Additionally, we also focus only on the use of ISPM *methodologies* instead of ISPM methods/techniques (e.g. stakeholder analysis, earned value analysis, network planning, risk analysis etc.) and tools, since tools (e.g. project management information system, excel/ word based Templates, ARIS etc.), techniques and methods can be used in the absence of a formal methodology, and the use of a methodology represents a radical change compared to the use of methods/tools [8]. Reasons why the adoption and use of new ISPM methodologies might be so different and so much more challenging than the adoption of specific methods and tools lie partly in the tacit organisational and individual problems that are caused by the introduction of new methodologies. For example, the stress associated with the learning of a new methodology, the fear and impact on self-esteem and identity associated with the organisational restructuring or re-engineering, and the emotional costs of role conflict and ambiguity or workplace transformation might be

serious inhibitors of ISPM methodology acceptance and usage [15].

In the context of methodology adoption, Khalifa and Verner [14] found that better process and product quality has a substantial effect on a software developer’s decision to use waterfall and prototyping methodologies. Application of both technological and behavior models such as TAM and TPB come to similar conclusion and state that *usefulness*, a characteristic of a methodology is the single most important determinant of methodology acceptance and use by its actual users [16,8,9]. Subsequent research has therefore focused on this particular variable but neglected other potential crucial attributes of a methodology. For example Riemenschneider et al. [9] apply five theoretical models and conclude that “...if a methodology is not regarded as useful by developers, its prospects of successful deployment may be seriously undermined”. Hardgrave and Johnson [16] also conclude that “...software developers do not view their personal benefits separately from organisational benefits” [16]. Therefore, the personal usefulness (PU) of a methodology might not affect their decision to use it. Hardgrave and Johnson [16] come to this conclusion because they could not psychometrically separate their PU construct from their organisational usefulness (OU) construct. We suggest differentiating between OU and PU based on other grounds and seek to provide a solution in our conceptual model.

However, critics have suggested that TAM and TPB are too parsimonious and need to be expanded by integrating variables specific to the methodology under investigation [17]. Nevertheless, even when a handful researchers attempt to examine other methodology attributes, the attributes are found to be either not significant or their effect negligible – e.g. [8,9] partly because these studies neglect to integrate other nontechnical and noneconomic variables from related theoretical perspectives [17]. As Warner [18] observes, the concept of adoption is a complex social phenomenon which involves both technical and nontechnical factors and sociologists would undoubtedly agree with this view. Unfortunately, the several different disciplines, generally concentrating on their individual variables, have neglected to incorporate the personality attributes in understanding the methodology acceptance problem. As such, little is known about the interactive effects of the attributes of methodologies and the nontechnical personality characteristics and it seems reasonable that variables from both sets are important in explaining the problem at hand [18].

3. METHODOLOGY

An exploratory investigation was conducted to examine practitioner perceptions towards methodology acceptance and usage. We accompanied a large multinational professional service firm (140,000+ employees) in its endeavour to develop three IS management methodologies: a) IT project and portfolio management, b) IT benefits management, and c) Enterprise architecture management (Table 1 provides an overview of the methodologies studied).

Table 1. Overview of Methodologies

	Methodology A	Methodology B	Methodology C
Name	IT Benefits Management	IT Project- /Portfolio Management	Enterprise Architecture

			Management
Description	Development of a methodology to manage, so that potential benefits arising from IS projects are realised	Development of a comprehensive PPM methodology to ensure the efficient and effective execution of IT projects	Development and implementation of a methodology to improve the alignment of business and IT in an enterprise
Data Sources	Interviews, document review, field notes	Interviews, field notes, questionnaires, protocols	Interviews, field notes, document review
Individuals/ departments involved	Project managers, PMO, Corporate Controlling (CC), benefits managers, consultants	Project managers, Project management office (PMO), CC, IS managers, consultants	Enterprise architects, CIO, business analysts and functional managers

The ability to observe the development process of various methodologies deemed the organisation as a fruitful ground for our investigation. Multiple data collection methods are applied, based on a) archival sources, b) unstructured and semi-structured interviews (lasting 30 to 60 minutes each) with individuals involved in the management of the organisations' IS/IT, c) protocols, document review and field notes of multiple workshops (each lasting five to eight hours) involving representatives of upper management, corporate controlling (CC), IT project managers (PM), and the Project Management Office (PMO). An exploratory investigation, involving such a diverse segment of users, developers and supporters provided us with a holistic understanding of the development of individuals' beliefs, attitudes and usage behaviours. In-depth interviews allowed us to better understand the process by which people reach decisions about

using a particular methodology since "...it records more fully how subjects arrive at their opinions. The way subjects ramble, hesitate, stumble, and meander, as they formulate their answers, tips us off to how they are thinking and reasoning." [19]. The interactive workshops in particular allowed us to gain a deep understanding of the interplay between different organisational members/departments. Field notes and protocols that were gathered in the workshops and team meetings, in which individuals shared their thoughts and emerging ideas, provided clues about relationships, anecdotes and informal observations [20]. Interviews and workshop protocols were generally conducted and written by two investigators, face-to-face. In order to strengthen the internal validity and generalisability of our research, existing literature and theories, the TTIB framework was used to form a priori concepts/codes, to develop the interview guide and to structure field notes/protocols [16]. Prior to a workshop or an interview, we created a text document based on the TTIB concepts/codes. For every dimension, we left a blank page in which we noted our observations and interpretations. Such a prestructured document helped us to swiftly note our observations and thoughts, and to allocate them to the right concept/code without having to interrupt the participant. This also helped minimise data loss as a result of the investigator not being able to keep up with the fast pace of the workshops and interviews. In short, the a) investigator, b) theory, and c) method triangulation technique that is applied in our study provides stronger substantiation of constructs and propositions. Table 2 provides an example of the qualitative data we collected in 8 semi-structured interviews with project managers and in 15 methodology development workshops.

Table 2. Example of Qualitative Data on Methodology Acceptance and Use

Dimension	Expressed by	Interview/ Workshop Participant Comments, Observations and General Findings
Task-oriented usefulness	Project manager (PM), Project team member (PTM)	Majority of the interviewees mentioned the usefulness of a particular methodology in achieving project goals to be a key determinant of their decision to use the methodology. A project manager gave an example of a Software Development methodology that was developed by the organisation over a period of 2 years and with considerable resources. He mentioned that the methodology was never used the way it was supposed to be used because it was so complex, comprehensive and "over-engineered" that most managers felt that it was counterproductive.
Pleasure/ Enjoyment	PM, PTM	Interviewees occasionally mentioned experiencing 'pride' when using a methodology because they had mastered its use. One person felt 'loyal' towards the organisation by strictly using the methodology as requested of him. Some IT managers hinted at experiencing 'excitement' at the thought of being able to experiment with various methods and techniques, or felt a sense of 'accomplishment' or 'self-actualisation' by using a methodology.
Materialism	PM	An interviewee mentioned that he used a methodology as insurance in case projects fail. By adhering strictly to the methodology, he can deny responsibility for the failed project and simply "blame the methodology". In such a scenario, a methodology is used because through its use the user can avoid negative career or monetary consequences because of failed projects.
Awareness	PL, CC, PMO, PTM	Some of the workshop participants were influenced by the opinions of external consultants who were experts on methodology engineering. Workshop participants reacted positively to solutions and explanations provided by these experts and actively sought their advice by asking questions.
Capabilities and Experience	PM, PTM	We observed that inexperienced users often doubted their skills and knowledge regarding the correct use of a new methodology. We also noticed that project managers with more than 5 years' experience were more actively involved in the interactive workshops and provided suggestions on how to improve the methodology. Project managers with less than 2 years' experience with methodologies repeatedly mentioned in interviews and workshops that they needed better training in the use of complicated methodologies. Project managers raised a number of questions regarding the effort involved in learning

		the new methodology and the support provided from the organisation.
Organisational support	PM	Demands for more support and political backing were reported in the interviews. One of the managers mentioned that “we don’t get help from the project management office when we run into conflicting situations regarding using a methodology. The only way we resolve the problem is through using our social networks and getting help from experienced colleagues. A person who doesn’t have a good social network because he is new in the organisation finds it extremely hard to use the methodology correctly”.
Voluntariness of use	PM, PMO, CC	During a workshop, when PMO and CC representatives tried to force project managers to adopt a certain way of executing an IT project management methodology, one of the managers replied aggressively, saying “I refuse to do this. I will not use the methodology like this. It will never work”. A PMO representative stated in an interview that “we cannot force them (project managers) to do something they don’t find right. There are always some loopholes in procedures and they will use these loopholes to use the methodology the way they want to”. We therefore infer that even though organisations can deploy obligatory methodologies, their actual use cannot be forced and thus correct usage is ultimately a voluntary user act.

4. CONCEPTUAL FRAMEWORK AND HYPOTHESES

The decision to adopt a methodology requires time, energy, and careful consideration on the potential user’s behalf [21]. Since intention to use a methodology is a measure of the strength of a person’s intention to actually use it, literature suggests that a person’s intentions indicates how hard he or she is willing to try and how much effort he or she is planning to exert to actually use the methodology. Research on behavioural decision-making also posits, based on a number of empirical studies, that there is a strong relationship between behavioural intention and the actual behaviour, i.e. intention to use a methodology and its adoption and actual use [22], [23], [24], [17]. We construct our theoretical framework (see Figure 1) based on a subset of the TTIB model according to which, an individual’s intention to use a methodology depends on cognitive as well as automatic behavioural influences, namely:

- a) the person’s attitude towards the methodology (his or her belief that using the methodology will lead to certain favourable or unfavourable outcomes) examined in section 4.1,
- b) subjective norms (which refer to perceived pressure and influence exerted from a person’s social environment, forcing him or her to either use the methodology or to not use it) examined in section 4.2,
- c) perceived behavioural control (the person’s belief that he or she has adequate external and internal control over the use of a specific methodology) examined in section 4.3 and 4.4, and
- d) habits (the persons subconscious use of a specific methodology) examined in section 4.5.

Results of our exploratory investigation (see table 2) provide further empirical evidence for the existence of the above mentioned antecedents of a person’s intention to use a methodology.

4.1 Value

The usefulness of an ISPM methodology is reflected in the value that would be generated through its use, originating in an individual’s mind through cognitive mechanisms that relate to goal attainment [23]. Although past research has focused primarily on task-related *utilitarian value*, which seeks to provide instrumental value to the user – such as increasing task performance, efficiency and productivity [25], research in the

field of consumer behaviour suggests that there are other sources of value related to one’s personal goals– *hedonic value* [26] – that are more subjective and personal than its utilitarian counterpart [25] and *materialistic value* [27] – that focuses on the acquisition of worldly possessions. Hedonic value is generated as a result of pleasurable experiences that a person might encounter through sensations generated on multiple sensory channels by using a methodology [25]. Hedonic value may therefore be defined as the extent to which the activity of using a methodology is perceived as being enjoyable in its own right, apart from any performance consequences that may be anticipated [28]. Even though individuals may not expect using methodologies in organisational settings to prompt high levels of fun, we argue – similar to Venkatesh [24] – that *methodology enjoyment* is still expected to be a relevant factor in influencing an individual’s perceptions of a methodology, as “...enjoyment not only includes the desire for fun but also involves, among others, exploration, discovery, challenge, loyalty and curiosity”.

Materialistic value, on the other hand, is based on an orientation that describes material goods and money as important for personal happiness and social progress. According to Belk [27] “...at the highest levels of materialism, such possessions assume a central place in a person’s life and are believed to provide the greatest sources of satisfaction and dissatisfaction”. In the context of our study, materialism refers not only to monetary advantages but also involves intrinsic rewards such as respect, status and acceptance [29]. Our proposed study of usefulness of a methodology from three distinct perspectives captures more details about an individual’s attitude towards the use of a methodology, and might be the solution to the psychometric problem faced by Hardgrave and Johnson [16] (see research methodology section). While utilitarian value can be considered to be primarily a manifestation of organisational usefulness, hedonic and materialistic value typically reflect personal usefulness.

4.2 Workgroup Influence

Extensive research on human behaviour shows that a methodology’s use is influenced by an individual’s perception that people who are important to him think he should or should not use it[30]. According to Venkatesh and Davis [17], the reason why workgroup influences directly impact a person’s intention to use a methodology is because people may choose to use the methodology, even if they don’t have a favourable attitude towards its use or the consequences of its use, if they believe that “...one or more referents they think would, and they are sufficiently motivated to comply with the referent’s opinion”. In

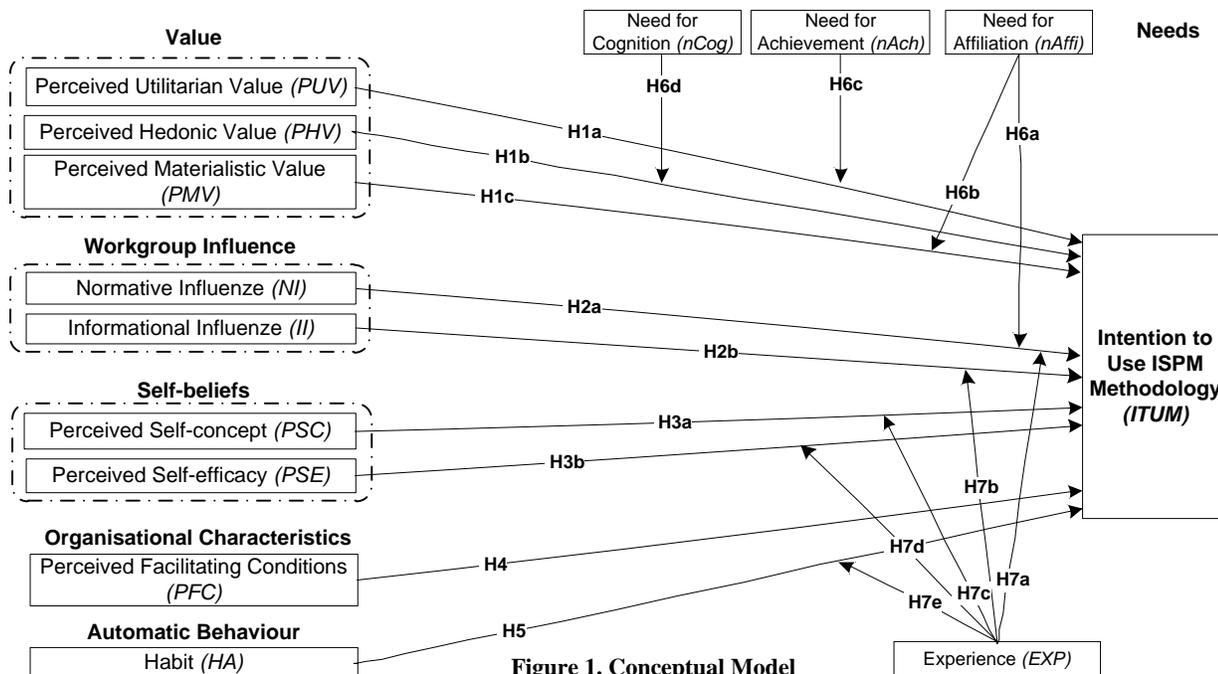


Figure 1. Conceptual Model

order to fully understand the effect of social influences on a user's behaviour, Deutsch and Harold [31] suggest two dimensions of workgroup influence – a) normative and b) informational influence. *Normative influence* (NI) refers to an individual's tendency to conform to group members' expectations. It implies that a person's decision to use a methodology is influenced either a) by the user's motivation to conform to the opinions of his work environment (e.g., colleagues, supervisor) in order to realise a reward or avoid a punishment mediated by them, or b) by the user's motivation to satisfy his notion of self-definition by doing what his or her peers (whom he or she wants to be like) do [32]. On the other hand, *informational influences* (II) refer to the tendency to perceive information gained from others as indicative of reality [31], and implies that a person's decision to use a methodology is influenced by the information provided by "mediums of knowledge" such as experts or publications on the topic [32]. Informational influence is indicative of uncertainty on the part of the influenced. In other words, an individual relies on information from others to make informed choices and to reduce uncertainty regarding the "soundness" of his intention to use an ISPM methodology about which he himself has little knowledge. A number of studies have explored these theoretical mechanisms and have found significant support for the ability of workgroup influences to affect a person's intention to act in a particular manner [30,33].

Self-beliefs

In the 1950s, coinciding with the zenith of behaviouristic influence, the "humanistic revolt" in psychology called for renewed attention to inner experience, to internal processes and to humans' self-relevant perceptions. Since then, there has been a resurgence of interest in this field, confirmed by numerous studies, to promote an emphasis on the importance of healthy and positive self-perceptions. Bandura [34] suggests that such self-perceptions involve processes of self-reflection, through which

individuals are able to evaluate their experiences and thoughts, and determine what they will do with their knowledge and skills, i.e. their competence. Judgment of one's personal competence reflected in one's self-beliefs therefore not only determine what a person decides to do but also "...how much effort people will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will prove in the face of adverse situations" [35]. Consequently, in the context of our study, the more positive the self-beliefs, the stronger the intention to use an ISPM methodology, the greater the effort invested to use it, and the stronger the persistence and resilience. Two types of such self-beliefs have been especially dominant in motivation research — self-efficacy and self-concept beliefs.

Based on Bandura's [34] research, *self-efficacy* — a core construct in his social cognitive theory — refers to the belief that one has the capability to perform necessary actions in order to be able to use an ISPM methodology. In the context of this study, *perceived self-efficacy* (PSE) refers to the degree to which a person believes that using a particular methodology would be a) free of physical and mental effort and b) easy to learn [22]. It is important to note that self-efficacy judgments are very task and situation specific. Individuals make use of these judgments in reference to some very specific goals and characteristics of ISPM usage that cannot be generalised to other domains [34].

While self-efficacy beliefs are sensitive to contextual factors, *perceived self-concept* (PSC) beliefs are general or domain specific feelings of self-image. Self-efficacy and self-concept represent different views of oneself. The difference between the two constructs lies primarily in the notion that self-efficacy is *task-specific*, whereas self-concept is *domain-specific* i.e. "self-concept is measured at a more general level of specificity and includes the evaluation of such competence and the feelings of self-worth associated with the behaviours in question" [35]. For example, in the domain of mathematical academic performance, a typical self-efficacy task-specific question is, "How confident are

you that you can successfully solve ... equation”, which differs from the general domain specific item, “I am good at working with numbers”.

Although a number of studies in the past two decades have examined self-efficacy and self-concept individually, few researchers have explored the relationships between them [35]. As is the case with behavioural decisions, it is likely that different situations call forth different self-beliefs. In the context of our study, we suggest that when individuals are familiar with task demands (i.e. what is required to successfully use an ISPM methodology), they may call on the task-specific *self-efficacy* beliefs to help them decide whether to use the methodology or not [35]. But when task demands are unfamiliar (for e.g. because the user has never used ISPM methodologies before and therefore cannot judge the skills required to master the methodology), they generalise from prior attainments that are perceived as similar to the required task [34]. So, they call upon the domain-specific *self-concept* and gauge their perceived competence with their self-concept beliefs, which they consider to more closely correspond to the novel requirements of using a ISPM methodology. (Consider, for example, the person’s self-concept that he is good at strictly follow procedures. If a person concludes that he is generally good at following rules, he might also conclude that he will be able to use the specific ISPM methodology. This might be the case because, although not familiar with the specific requirements of using an ISPM, the individual does know that like other methodologies an ISPM requires the user to rigorously follow structured procedures, an act that he considers himself to be good at). The reason why we attempt to study the mutual effect of self-efficacy and self-concept is not to maximise the explanatory power of our model but rather to fill this important gap in existing literature. The *empirical focus* of this argument (self-efficacy vs self-concept) centres on the question of which self-belief provides the greater explanation and prediction of an individual’s intention to use a methodology; the *conceptual focus* centres on which beliefs individuals attend to as they go about the business of day-to-day living [35].

4.3 Organisational Characteristics

Whereas self-belief is understood as the user’s confidence in his ability to independently use a methodology (reflecting an internal locus of control), social psychology literature suggests that there is another dimension to the effective use of a methodology. This dimension is termed *facilitating conditions* – the user’s perceived control over external resources that are needed to use a methodology (reflecting an external locus of control) [36]. As such, facilitating conditions can be understood as the degree to which a user believes that organisational resources are available that will help him use a methodology. In the context of our research, these desirable organisational resources can be considered as support offered by organisational units (such as the PMO or top management) in the form of guidance in the correct usage of methodologies, or political backing. The more a user believes that he or she can get such external resources when he or she needs them, the more confidence he or she will have in successful usage, and the more inclined he or she will be to use that methodology.

4.4 Automatic Behaviour

Plato theorised that “the human mind possessed three distinct faculties: *cognition* or knowing, *emotion* or feeling, and *conation* or willing” [37]. Two of these constructs, cognition and conation, represent people’s conscious (intentional) behaviour when trying to explain and predict the use of methodologies. While past research in the field of human usage behaviour has focused primarily on understanding an individual’s *planned* (i.e. intentional) decision-making, we also need to consider a person’s subconscious (automatic) behaviour, also known as habits, which refer to the non-intentional, automatically inculcated reactions [38]. Habit is portrayed “...as a well-learned action sequence, originally intentional, that may be repeated as it was learned without conscious intention when triggered by environmental cues in a stable context” [38]. In the context of using a new ISPM methodology, we suggest that individuals in organisations might be reluctant to change their habits, which they have learned unconsciously through past repetitions, and might therefore be unwilling to adopt new methodologies. As such, including the habit construct in our behavioural model adds further explanatory power for methodology usage.

4.5 Moderating Influence of Personal Characteristics

Researchers, attempting to understand and predict behaviour with the help of causal models, as is the case with positivistic confirmatory research, base it (usually unknowingly) on the philosophic idea of *Determinism* – a view that every event, including human cognition, behaviour, decision and action is causally determined by an unbroken chain of prior occurrences. Based upon this determinism of human behaviour, the theory of orectic psychological determinism states that people must always act upon their greatest desire and needs [39]. To do otherwise would be irrational. As such, based on needs theory (e.g. [11], [12], [40]) in humanistic psychology, individuals are expected to use a ISPM methodology based on their perceptions that it will enable them to fulfil their specific needs. Many definitions of basic needs have been proposed, of which the one provided by Ryan and Deci [41] is most consistent with the scope of this study. They indicate that “a basic need, whether it be a physiological need or a psychological need, is an energizing state that, if satisfied, conduces toward health and well-being but, if not satisfied, contributes to pathology and ill-being” [41]. This implies that the factors that will be most influential in helping an individual decide for or against the adoption and use of an ISPM methodology are those that satisfy his basic needs. The inability to do so might result in serious discomfort, and this dissatisfaction might be visible in the individual’s rejection of the particular methodology. Needs of an individual are thus expected to play a *moderating* role (as depicted in our research model in Figure 1) and influence the explanatory power of the determinants of intention to use ISPM methodology.

In our research, we specifically focus on moderating effects because – besides the examination of direct effects – scholars are increasingly seeking to understand complex relationships [42]. While the literature emphasises the need to take moderation effects [43], its neglect has led to a lack of relevance as “...relationships that hold true independently of context factors are often trivial” [42]. For the purpose of our study, we employ Murray’s theory of psychogenic needs [12], and Reiss’s theory of

16 basic desires [44] as these are considered the most fundamental and comprehensive list of underlying psychological human needs and motivational processes:

4.5.1 Need for Affiliation (*nAffi*) is the desire to achieve acceptance from one's social surroundings [12]. Individuals with a high need for affiliation tend to enjoy being with other people, making friends, and maintaining personal relationships. Affiliation-oriented employees tend to gravitate towards behaviors that allow them to develop warm and caring relationships with other employees. In a work environment, materialistic endowments such as rewards, promotion, gifts and praise from peers have been found, in a number of studies, to be conveyors of, and adequate substitute for, positive interpersonal relationships and feelings of acceptance [27]. Additionally, since individuals with high *nAffi* seek to develop strong social relationships with individuals in their work environment, they will more likely comply with requests, appeals and influences of their seniors, peers and colleagues in order to gain their acceptance. Based on this reasoning, *nAffi* is expected to have a moderating effect on the strength of the effect of PMV → ITUM, and NI → ITUM.

4.5.2 Need for Achievement (*nAch*) refers to an individual's desire to do things better, accomplish difficult tasks, overcome obstacles, become an expert and achieve high performance standards, or a need for significant task related accomplishment [12]. People high in *nAch* aspire to accomplish difficult tasks where success depends primarily on their efforts. The more complex a task is, the more gratification/satisfaction people with high *nAch* are expected to feel, since being successful at tasks in which others have failed symbolises and communicates personal competence. Individuals with high *nAch* are expected to expend more effort, persevere longer when confronted with obstacles and show resilience in the face of adverse situations [35]. Such individuals are more focused on internal motivation and personal achievement rather than external rewards and recognition. As such, employees with a high *nAch* will only use a methodology if they can be convinced that the methodology will enable them to achieve high performance, productivity and become good at their job. We therefore propose that *nAch* will have a moderating effect on the strength of the effect of PUV → ITUM.

4.5.3 Need for Cognition (*nCog*) is the desire for knowledge and reasoning [12,44], as well as the need to explore and discover. They tend to be information seekers, engage in and enjoy effortful cognitive activity. Individuals high in need for cognition naturally tend to seek, acquire, think about and reflect back on information and experiences by experimenting and exploring, to make sense of a newly implemented methodology [45]. Therefore, people high in the *nCog* are more likely to want to try out a new ISPM methodology because they enjoy and find this process of exploring and understanding new concepts for themselves highly satisfying. Consequently, we expect *nCog* to will have a moderating effect on the strength of the effect of PHV → ITUM. Neglecting to integrate *nCog* in past research might explain why many empirical studies in the field of MIS report that hedonic value has only weak or no effect on human motivation.

Empirical research has shown that the above-mentioned needs are largely unconnected to one another [44,46]. Although the list of

needs in the literature is extensive, we consider these three needs to be representative of the most fundamental high-level primary needs in the context of influence tactics, in the sense of being innate or "hard-wired" [46]. Other secondary needs can be derived from these high-level primary needs. For example, Murray's *need for play*, *need for curiosity*, and *need for understanding* may be attributed to *nCog*, the *need for contrarience*, and the *need for acquisition* may be derived from the *nAch*. The *need for family* – as proposed by Reiss [44] – and the *need for social recognition* may be attributed to the *nAffi*, and the *need to compete or win* can also be derived from the *nAch* [46]. Another reason to study fewer needs (rather than more) is related to the value of a parsimonious approach: as the list of needs increases, the utility of the approach diminishes. A long, unwieldy list of needs is precisely the reason why earlier needs-related theories fell out of favour [47].

4.5.4 Experience (*EXP*) is defined as the degree of knowledge or skill in the use of ISPM methodologies that is acquired over time through practical use, and has a significant impact on a person's behaviour [23]. Experience has been reported in a number of conflicting studies to affect the degree to which individuals use methodologies. For example, Fitzgerald [2] found that experienced software developers were less likely to follow a methodology rigorously, whereas less experienced developers were more likely to do so. On the other hand, Leonard-Barton [48] suggests that experienced developers are more likely to use a methodology. However, Kozar [49], and Lee and Kim [50] report that more experienced developers are less likely to follow methodologies and procedural formalisation, partly because of the accumulation of systems development know-how among them. Consequently, conflicting results reported in previous studies warrant a deeper investigation in how individuals' experience might affect their intention to use an ISPM methodology.

Bandura [34] suggested that one's experiences are the most influential source of self-beliefs. According to him, positive experiences increase one's self-confidence in one's abilities and, as such, lead to positive self-beliefs. Research based on experiential learning theory and social cognitive theory, especially in the context of the development of managerial skills, also states that work experience leads to increased organisation-based self-beliefs [51]. This implies that for individuals with *high* experience in the use of ISPM methodologies, perceived self-efficacy will have high explanatory power (since self-efficacy is task-specific, individuals who have had prior experience with the use of ISPM methodologies are in a better position to judge if they have the necessary skills to use the methodology). On the other hand, for individuals with *low* or *no* prior experience, perceived self-concept will have higher explanatory power, since task demands are unfamiliar to them. Furthermore, as the intensity of a habit is a function of past activities and is developed over time through repeated use, we expect that habit is stronger in the case of experienced users. Experience is also expected to influence the effect of workgroup pressure on methodology usage, since inexperienced users are more likely to consult information sources and adopt the views of experienced seniors and colleagues whom they consider to be experts in the correct usage of the methodology [31,17]. We therefore include the experience construct in the conceptual research model as a moderator that affects the relationship between intention to use ISPM

methodologies and workgroup influences, self-beliefs and automatic behaviour. The related research hypotheses are summarised in Table 1. The table also provides an overview of some studies that have used highly validated instruments to operationalise the constructs of our conceptual model.

Table 3. Research hypotheses and prior operationalisation of respective constructs

H1a, H1b, H1c: PUV ^b , PHV ^c , PMV ^d are positively associated with ITUM ^a
H2a, H2b: NI ^e , II ^f are positively associated with ITUM ^a
H3a, H3b: PSC ^g , PSE ^h are positively associated with ITUM ^a
H4: PFC ⁱ is positively associated with ITUM ^a
H5: HA ^j is negatively associated with ITUM ^a
H6a, H6b: The influence of NI and PMV on ITUM will be moderated by <i>nAffi</i> ^k so that the effect will be stronger for individuals with the specific need.
H6c: The influence of PUV on ITUM will be moderated by <i>nAch</i> ^k so that the effect will be stronger for individuals with the specific need.
H6d: The influence of PT on ITUM will be moderated by <i>nCog</i> ^l so that the effect will be stronger for individuals with the specific need.
H7a, H7b, H7d, H7e: The influence of NI, II, PSC, PSE, HA on ITUM will be moderated by <i>EXP</i> ^m so that the effect will be stronger for individuals with more experience.
H7c: The influence of PSC on ITUM will be moderated by <i>EXP</i> ^m so that the effect will be stronger for individuals with less or no experience.

^a[17,23]; ^b[22,25,24,23]; ^c[26,28,25,52]; ^d[53,27]; ^e[17,23]; ^f[54,55]; ^g[56]; ^h[57,58]; ⁱ[36,24,23]; ^j[33]; ^k[59,60]; ^l[45]; ^m[17,23]

5. LIMITATIONS AND NEXT STEPS

Although, our proposed model examines the methodology acceptance issue in a holistic manner, the present research has some limitations that should be noted. Firstly, the exploratory field study was conducted in a single organisation and country. Although the company is a multi-national organisation with operations all over the world, there might be structural and cultural influences that vary in different market sectors and countries, and need to be taken into consideration when evaluating the consistency of our findings. Secondly, our study of intention to use might be a particular limitation of this research because intentions (even though they play a major role in determining actual use) do not always lead to actual use. As such, future research might be able to build upon our findings and study actual document use. Regarding operationalization of the proposed constructs there might be a possibility that prior instruments might not be suitable to establish appropriate levels of discriminant validity in the context of our study and therefore new scales might need to be developed.

In developing the initial set of items, we will follow the advice of Straub [61] and employ a rigorous step-by-step iterative process, as well as utilise the existing literature (see Table 3 for an overview of the prior operationalization of constructs). After obtaining the initial battery of items, two researchers will conduct expert interviews with six subject matter experts (three academics and three practitioners) to obtain specific information as to whether the initial items are comprehensible, valid and complete [61]. In order to further improve content and construct validity,

we will subsequently conduct a Q-sorting and item ranking in two rounds. In the final step, the questionnaire will be subject to a pre-test, based on a convenience sample with individuals who represent the target population. The final survey instrument will be web-based, administered to a diverse population of ISPM methodology users, to collect quantitative data, needed for testing the model and hypotheses. In order to understand cultural influences, data will be collected from the USA, Germany, Austria, Switzerland and India. We will attempt to include more countries, especially developing and Asian nations such as Japan, China, as well as African nations, as research based on Hofstede's cultural dimensions [62] has shown that individuals from these nations, when compared to Western nations, are governed by different attitudes, preferences and norms.

6. CONCLUSION

Our work seeks to further the research on individual acceptance and adoption of ISPM methodologies by unifying the theoretical perspectives on *cognitive* and *automatic behaviour* and the *needs of individuals* within a single model. Based on validated theories - particularly from the fields of sociology and psychology - and an exploratory field study, we propose a conceptual model. This research model holds that personal traits of individual - especially their needs and experience - determine that determinants of ISPM methodology acceptance has a larger effect on the individual's intention to actually use the methodology. The proposed multidimensionality of a methodology's value represents a departure from traditional operationalisation (which is based solely on task-oriented advantages) and might reveal more complex and until now unknown interaction effects on human behaviour, especially in regard to the use of new methodologies. Furthermore, the mutual study of the influence of self-efficacy and self-concept beliefs is an attempt to provide much needed conceptual clarification on which self-belief is a stronger predictor of methodology adoption, and under which circumstances. While we propose that the predictive power of the self-beliefs varies with individuals' experience with ISPM methodology use, future research should attempt to dig deeper and find further factors that might help to understand the theoretical functioning of the two self-beliefs.

The proposed study of the interaction effects of needs and experience from a temporal point of view is a new approach. While needs are long-lived traits, experience changes gradually. Our findings might have major implications not only for the MIS research community but also for related fields in that it might be able to explain a) how needs change over time with experience for men and women, and b) how these changes determine which determinants of intention to use a methodology becomes more important over time with experience. Human needs have always played a key role in organisational development, and the proposed study is an attempt towards "humanising" organisational ISPM methodologies [63], that is, to enable organisations to be more responsive to human concerns when developing and implementing new methodologies. However, our study of intention to use might be a particular limitation of this research because intentions (even though they play a major role in determining use) might not always lead to actual use. As such, future research might be able to build upon our findings and study actual documented use.

Our research also has significant implications for practitioners. Each of the proposed constructs reveals a different aspect of human behaviour and personality, and each can serve as a point of attack for organisations in their attempts to steer them in the desired direction [30]. Our findings could help organisations to manage the selection, development, introduction, adoption and use of new methodologies. We propose that future research should study the determinants of the constructs identified in this study, as well as the interrelationships between them. Another very promising field of focus is cultural influences on human behaviour. Although the understanding of cultural influences has been repeatedly emphasized by top journal editors – e.g., Straub [64] – it is seldom incorporated in research, generally because of the difficulty of data collection. If successful in collecting sufficient data for statistical analysis from a wide range of *different types* of cultures – categorised by Hofstede [62] – our study, as proposed, will further improve the generalisability of our findings, as well as seek to reveal new avenues and “blue ocean ideas” [64] for future research. A better understanding of these determinants would enable us to design organisational interventions that would increase new ISPM methodology usage in order to improve productivity and quality, as well as to reduce effort.

In conclusion, user acceptance of ISPM methodology remains a complex and elusive, yet extremely important, phenomenon. Past research has made progress in unravelling some of its mysteries. The development and testing of our model seeks to advance theory and research on this crucial matter.

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