Lee-Roy Chetty – Addressing the Housing Shortage in South Africa

Mail & Guardian. December 1, 2012. Access for the poor to urban land and housing is one of the main challenges facing policy makers in South Africa.
Estimates suggest that 26% of households in the six metropolitan areas in our country live in in-formal dwellings, often “illegally” and with limited access to services.
Movement from the informal to the formal sector is also low.
The growth of informal settlement in cities is often the upshot of unplanned urbanisation or lack of coordination. The concept of new urbanism emphasises coordination between long term land use, housing and transportation planning as an essential pillar for smart growth.
It recognises the importance of spatial or geographic proximity, layout and an integrated design of those uses.

Conversely, a lack of efficient integration can throttle sustainable development and eventually leads to an inferior growth path with suboptimal housing, educational, employment and service opportunities.

Read more: Chetty – Addressing the housing shortage in South Africa

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Melissa Fernández Arrigiota – Constructing ‘The Other’, Practicing Resistance: Public Housing and Community Politics

in Puerto Rico

PhD thesis, 2010, *The London School of Economics and Political Science (LSE).*

This thesis evaluates the colonial productions and contestations of Puerto Rican public housing and its residents as urban 'others'. It combines a historical analysis of the political, spatial and material trajectory of the island's projects with an ethnography of the resistances enacted by a group of residents- mainly women- from one such complex called '*Las Gladiolas*' against an impending order of demolition and displacement. I argue that while a context of socio-spatial exclusion and environmental determinism has pervaded the constructions of these postcolonial '*projects*' in ways that have significantly discriminated against its residents, public housing has never been and can never be completed according to that limited governmental design – which today exists under the rubric of urban redevelopment – mainly because communities of solidarity, dissent and conflict emerge simultaneously with and against those formulations, taking on a life of their own in ways that collude with and escape rigid technocratic formulations of housing policy. The research presented emphasizes the symbolic struggle and material reality embedded in Las Gladiolas's community politics which resists and disrupts a homogeneous vision of past, present and future urban space.

The historical analysis highlights the ways in which '*othering*' was set in place within the colonial context of Puerto Rico's urban development in a way which has allowed for the continued stigmatization of public housing projects and for the reproduction of residents' disadvantage according to raced, gendered and classed discriminations. Those distinctions of difference also created the conditions for particular forms of resistance to emerge. The ethnographic data tells the story of how the political and physical enactment of the buildings' deterioration intersected with residents' informal, institutional and legal resistance to relocation. It shows how the contemporary production, experiences and contestations over public housing are not fixed, but multiple and highly ambiguous. The complex interplay that emerges between political, social and material elements demonstrates that the boundaries separating Las Gladiolas from its urban environ, and Puerto Rican housing agencies from the American ones, are in fact open and porous, fluctuating according to use, appropriations, and political and legal transformations.

Full text: M.Fernandez Arrigiota – Constructing The Other

IIDE Proceedings 2011~ Re-Integrating Technology And Economy In Human Life And Society ~ Volume II ~ Contents & Preface

Contents

Preface

This Volume II, of the 2011 Proceedings of the 17th Annual Working Conference of the *International Institute for Development and Ethics*, offers seven research papers. Two common items of the first five papers is that they all address various issues of information and communication technology use and that their investigation rests upon Herman Dooyeweerd's theory of multiple aspects of reality. While the remaining two papers focus inter-human communication and time in human operation, respectively, all seven papers presented here deal with normative aspects of human affairs – in that sense all contributions here address human interest in our world. The papers are introduced shortly, as they appear, in the following.

Andrew Basden and Hawah Ahmad, with their *"Down-to-earth issues in (mandatory) IS use: Part I – Types of Issue"*, contribute to the discourse about those kinds of information systems that are mandatory in use. Their starting point is that "use is not serviceable as a guide to evaluating the quality of such use as experienced by stakeholders", as many "down-to-earth issues that are crucial to such quality are overlooked". They suggest that a new approach is required, which is based on what is *meaningful* in everyday life, that in turn may be comprehended by means of H. Dooyeweerd's notion of multiple modalities of human existence. They conclude that such an approach "provides a philosophical underpinning for not only understanding the nature of down-to-earth issues, nor just showing their diversity, but also for explaining why the notion of DTE issues is needed for analysis and understanding of IS use."

Hawah Ahmad and Andrew Basden, in the *"Down-to-earth issues in (mandatory) IS use: Part II – Approach to understand multiple meaning and reveal hidden issues"*, build their argument on the previous paper here, and thereby further advances our understanding of mandatory use of information systems, by means of the application of H. Dooyeweerd's multimodal theory. The authors present a single case study that makes them derive the conclusion that it is actually possible to obtain an in depth understanding, and to reveal the hidden issues, of mandatory IS use. The authors conclude with the thesis that the here proposed approach is more practical for information system evaluation than other currently employed approaches for such an end.

Samira Atashi and Andrew Basden, in their *"Investigating the effects of IS development ethical issues on information systems units"*, address the debate of

the likely effects of ethical issues of information system development on the consequent information systems as such. By means of theoretical study, the authors attempt to apply Dooyeweerd's theory of aspects or reality to ethical issues within the development of information systems and thereby explore and analyses their consequences of functioning regarding good and bad.

Subramanian Krishnan Harihara presents his work in progress in the *"Using Dooyweerd's Aspects to Enrich our Understanding of Idolatry*". This addresses the idolization of technology as a potential cause of the problems. In order to unearth such an idolization, various conceptual means have been advanced. The present contribution shows how H. Dooyeweerd's aspects of reality may be related to Goudzwaard's notion of idolatry; this gives rise to a discussion of how Dooyeweerd's aspects contribute to the understanding of idolatry as a cause of problems in e-government.

Sina Joneidy and Andrew Basden, in their *"How aspects of everyday life contribute to opening the 'black box' of Perceived Usefulness: Understanding the meaning of usefulness constructs"*, offer a meta-theoretical investigation of the seminal Technology Acceptance Model (TAM). For more than the past two decades, TAM has been developed by a diverse community of researches with the intention to provide explanation of human computer usage behavior and also to predict individual adoption and use of new information and communication technologies to answer the question of: why do not people make use of ICT more? In its current state, the conceptualization of perceived usefulness, within the TAM, is somewhat of a black box; it utilizes some 70 various constructs for its measurement. These constructs are not coherently organized, rather overlapping and competing. In their aspiration to remedy this situation, a re-conceptualization is initiated here. The latter is advanced by means of an attempt to obtain elaborated understanding of each construct available with the help of H. Dooyeweerd's philosophy of everyday life. The authors suggest that "this can lead to a more penetrating understanding of IS usefulness."

Pieter Lems, in his *"The communication of water managers in participatory processes and their effect on the support for implementation: A case study in the Netherlands"* addresses the general dilemma of finding a balance between a policy and its social support, here in the case of water management in the Netherlands. By exploring the communication processes of water manager, the presented case study suggests that emphatic communication enables for a water

manager to handle conflicting aims.

Fabian von Schéele and Darek Haftor, in their *"Cognitive Distortion Accounted Workload in Service Operations"*, highlight the generally overlooked phenomenon of the gap between the physical-time and the cognitive-time, which gives rise to the so-called cognitive time distortion. The latter is here elaborated rigorously and thereafter incorporated into the current understanding of an economic organization, i.e. a firm, with regard to the work time-load, both planned for and actually consumed by people within such organizations. A novel Workload Equation is introduced based upon the classic Total Profit Equation; the introduced equation may have a dramatic impact on our understanding and thus on the management of economic organizations, both their health and their financial performance.

This Volume represents a collection of papers that all provide thought provoking inquiries into urgent issues of our current world, so much dominated by technology and economic affairs. In his, the position assumed is of human interest as the primer one. All presented contributions here have a character of working papers that present research in progress. This in turn guarantees that the proposals put forward here are novel and not to be found elsewhere.

Editors: Christine G. van Burken & Darek M. Haftor

Information about the Annual Working Conferences
As an essential for the execution of its research, the IIDE sustains an international North-South network of senior academic researchers and their PhD students who are affiliated with different universities and institutions in the Netherlands, UK, Sweden, and South Africa**[i].**
One of its activities is the organisation of Annual Working Conferences (AWC) at the beautiful venue of the Emmaus Priorij at the river Vecht in Maarssen, near Utrecht, Netherlands. At these week-long events in April or May, participants present papers on their current research, receive comprehensive critical mentoring, and respond with ideas on how their research will be continued.
The formula of these AWC's has proved very successful in generating a flow of high quality papers, informing PhD research, and sharpening up ideas on a wide range of issues. The research of the past has resulted, amongst other things, in a series of Proceedings. The papers that are accepted have been sent out for a peer review. The title of each volume is borrowed from a Discussion paper which aims

to foster the ongoing reflection at the AWC's on the mission of the IIDE and its broad research agenda.

NOTE

i. This North-South network, formerly named the Centre for Philosophy, Technology and Social systems (CPTS), operates since 2010 within the organisational framework of the IIDE.

The following Proceedings have been published since 2002:

(2002) *On the Connections Between Philosophy, Technology and Systems Sciences*, edited by Johannes D. Bijkerk, Jan van der Stoep, Sytse Strijbos. Amersfoort: CPTS. ISBN 90-807718-1-3.

(2003) *Towards a New Interdisciplinarity*, edited by Rob A. Nijhoff, Birgitta Bergvall-Kåreborn, Anita Mirijamdotter, Sytse Strijbos. Amersfoort: CPTS. ISBN 90-807718-2-1

(2004) *Interdisciplinarity and the Integration of Knowledge*, edited by Marc J. de Vries, Birgitta Bergvall-Kåreborn, Sytse Strijbos. Amersfoort: CPTS. ISBN 90-807718-3-X

(2005) *Towards Humane Leadership*, edited by Albert Helberg, Jan van der Stoep, Sytse Strijbos. Amersfoort: CPTS. ISBN-10: 90-807718-4-8 and ISBN-13: 978-90-807718-4-0

(2006) *Integrating Visions of Technology*, edited by Andrew Basden, Anita Mirijamdotter, Sytse Strijbos. Maarssen: CPTS. ISBN-10: 90-807718-5-6 and ISBN-13: 978-90-807718-5-7

(2007/2008) *The Problem of System Improvement*, edited by Andrew Basden, Darek Eriksson, Sytse Strijbos. Maarssen: CPTS. ISBN 978-90-807718-6-4

(2009) *Systems Thinking and Philosophy as Interdisciplinarity*, edited by Andrew Basden, Leenta Grobler, Darek Eriksson. Maarssen: CPTS. ISBN 978-90-807718-6-4

(2010). *Interdisciplinary Research for Practices of Social Change*, edited by Roelien Goede, Leenta Grobler, Darek Haftor. Maarssen: CPTS. ISBN 978-90-807718-8-8

IIDE Proceedings 2011 ~ Vol. 2 ~ Down-To-Earth Issues In (Mandatory) Is Use; Part I – Types Of Issue

Abstract
The extant discourse about mandatory IS use is not serviceable as a guide to evaluating the quality of such use as experienced by stakeholders. Many 'down-to-earth' issues that are crucial to such quality are overlooked. A new approach is required, which is based on what is meaningful in everyday life of use rather than on the abstractions used in academic discourse. Reasons why these abstractions are unhelpful are discussed and Dooyeweerd's notion of modal aspects is proposed as a foundation for developing more serviceable approaches.

Keywords
Down-To-Earth, Mandatory Use, Dooyeweerd's aspects

1. *Introduction*
In the era of technology, many organisations have made substantial investments in information system (IS) with the intention of increasing organisational performance. So the success or quality of IS use is often linked closely to the extent to which it contributes to organisational life, and IS use is one the important areas to be considered by management when implementing or evaluating any IS (DeLone& McLean, 1992; Venkatesh,et al., 2003).
Since the link with organisational performance is complex, broad concepts are often employed in an attempt to understand it. A common example is the extent to which an organisation deploys IT to support operational and strategic tasks (Ives &Jarvenpaa, 1991), and this is the key consequent variable in Davis' (1989) technology acceptance model (TAM). IS use was among the most frequently used measured of success in 1992 and remained so for at least a decade (DeLone and McLean, 2003). Articles on IS use constitute around one third of the total

publication space in the top IS journals, MIS Quarterly and IS Research (Barki, et al., 2007).
There are two problems. Much of this discourse is irrelevant when considering mandatory IS use (MISU) since the use is by definition 100%. So alternative concepts have been suggested, such as 'intention to use', which is the secondary output of TAM.Later many studies specifically focused on mandatory IS use (Ram & Jung, 1991; Lou, et al., 1995; Singletary, et al., 2002; Adamson & Shine, 2003; Ward, et al., 2005; Linders, 2006; Hennington, 2007; Lee & Park, 2008).

So why should there be yet another paper on mandatory IS use? The second problem with extant discourse, even on MISU, is that it doesn't sufficiently express the reality of IS use on the ground.

Despite huge research in IS usage area, the use of the system is still not well understood (Mishra &Agarwal, 2009). Is it only a matter of time and incremental effort before IS use is understood? Yousafzai (2007) has collected 70 constructs related to perceived usefulness in IS use, so is it possible that IS use may be understood by rationalising them? Barki [2008] suggests four approaches to properly understanding the constructs, including defining them clearly, specifying dimensions and relationships, exploring their application to other contexts, and expanding their conceptualizaton.
Whilst such approaches might indeed help towards understanding of IS use, the present situation is reminiscent of some scientific endeavours that Kuhn (1970) observed that had reached a stage ready for paradigm shift. After a long period of incremental correction of previous views, an increasing sense of misfit between experienced reality and theories leads to a new approach to the area of reality, a new paradigm. The primary reason for this paper is to suggest a new way of looking at IS use; this focuses on what might be called *down-to-earth (DTE) issues* of mandatory IS use. The approach can perhaps be extended to non-mandatory IS use, so "MISU" is often rendered as "(M)ISU".

In this paper, quality of IS use is conceived more broadly and yet also, paradoxically, in a more precise way, because of a pluralistic approach. In most literature, 'good' (or successful, beneficial, high quality) IS use is conceived in terms of the organisation whereas this paper also takes into account the individuals who live and work with, or are affected by, the IS. In most literature, the notion of 'good' is located in abstracted, predefined variables like amount of usage, intention to use or perceived usefulness (Davis, 1989), and the plethora of

‘external variables’ encountered in actual experience of IS use [Yousafzai 2007] are deemed meaningful only insofar as they contribute to the predefined variables. This paper reverses this, treating this plethora of ‘external variables’ as that which is truly meaningful, and the supposed abstract variables are defined by reference to, and as an outcome of, what occurs in everyday experience of IS use. In most literature ‘good’ IS use is seen as a goal to which everyday experience should be designed to contribute while in this paper, the ‘good’ is seen as an outcome of that everyday IS use. Most extant research in issues of IS use has been of a positivist nature; this paper takes a more interpretivist approach. Most literature focuses on issues of interest to researchers and the academic or management communities, whereas this paper focuses on issues that are meaningful to users and others who experience the IS in use.

Finally, most literature, including Barki [2008], presuppose that the constructs that are important are those that researchers and others are currently discussing, whereas this paper recognises that there might be many that are not obvious, either hidden behind extant constructs or completely overlooked.
This is one of two papers. This paper introduces the notion of down-to-earth (DTE) issues and provides a philosophical foundation; the companion paper (Ahmad &Basden, 2011) discusses how DTE issues can be researched in practice by discussing an empirical method. The structure of this paper is: First extant issues in (mandatory) IS use are collected together, then a vignette of daily experience of mandatory IS use is reviewed to reveal what down-to-earth issues might be like. The difference between these and extant concepts is discussed, to highlight problems with extant literature. A way of understanding the root of the problem in extant literature is offered by the philosophy of Dooyeweerd, which is introduced. Then the problems of extant approaches are discussed in these terms, to yield proposals for a new approach. This forms the foundation for a second paper, Ahmad &Basden(2011) but also background for Joneidy&Basden(2011), both of which are in the same collection.

2. S*urvey of literature*

In order to evaluate specific cases of (mandatory) IS use as to their quality (and perhaps also to design IS, though this is not the focus here) it is necessary to work with a set of generic factors that are important contributors to high quality (M)ISU. Whether such factors constitute a formal or informal set is not of concern here, but it is necessary to go beyond narrative accounts of instances of use,

because we wish to be able to apply the evaluation in other contexts and (re)design the IS innovatively for the future. The set of factors can be applied to a variety of stakeholders, but especially the (potential) primary users of the IS because it is these whose tacit and explicit knowledge of the IS and the tasks they perform is most crucial.

Table 1. Extant issues in IS use

Authors	Issues
Adamson & Shine (2003).	• Subjective norms (influence by peers and superiors) • Computer self-efficacy (beliefs concerning their ability to perform specific tasks successfully, given a degree of expended effort, and persistence in the face of challenging situations). • System quality (acceptable standard for SW quality).
Barczak et al (2007).	• Project risk (uncertainty about future events and magnitude of potential failure). • Existence of project champion (enthusiastic and commited individuals to overcome resistence to an innovation and promoting the innovation). • Autonomy (degree to which the project team is able to make its own decisions). • Innovative climate (support creativity and willing to try new things and open communication among employees across functions). IT infrastructure (include HW, SW and HR to support users).
Boynton, Zmud, & Jacobs (1994).	• IT management climate (clear mission, planning commitment, information sharing, pushing down DM, use of task team and centralised DM and use of SOPs). • Managerial IT knowledge; • IT-management-process effectiveness (project management, services control, services planning, IS function management

Table 1(a) : Extant issues in IS use

The set of factors should be comprehensive and place no prior restrictions on what it is meaningful to consider, whether these arise from prior prejudices of either the researcher or the researched or taken-for-granted assumptions. The researcher and researched together should be able to reveal anything that might be relevant. A reasonable place to begin is to look to the academic literature to provide factors to consider, because these will be produced by reflection across a variety of situations and will to some extent have been tested for salience (whether by positivist or interpretivist means does not matter here). The current literature relevant to mandatory IS use yields a host of factors, a selection of which is given in *Table 1.*

This is only a selection of the issues, but in its diversity one can see much confusion, ambiguity and overlap. So, as Barki [2008] points out, there is a need for guidelines regarding how constructs may be developed. Whereas he suggests four approaches (mentioned above) to improving such constructs, we suggest that it might be useful to consider a different approach.

3. *Down-to-earth issues in (M)ISU*

These issues fulfill the need to build a conceptual theoretical model (formal or

informal) of mandatory IS use. While a unified theoretical model can indeed be constructed out of such issues [Venkatesh et al. 2003], it is doubtful how useful such a model would

	and development & maintenance).
Chang, Liu, & Fan (2010),	• Organizational support • Management support (symbolic actions - inform publicly the benefits of IS use and encourage extensive system use). • Technical support (technical assistance, technical construction and technical consultant)
Devaraj, Easley, & Crant (2008)	• Subjective norms. • Openness (Individuals described as high on the openness-to-experience dimension of personality are willing to try new and different things). • Neuroticism (low Neuroticism - are emotionally stable and well adjusted; in contrast, those high in Neuroticism are anxious, self-conscious, paranoid and prone to negative emotions and negative reactions to work-related stimuli). • Agreeableness (kind, considerate, likable, helpful and cooperative). • Conscientiousness (to achieve, performs at a high level, and take actions to improve job performance). • Extraversion (personality traits that will have and affect on one's belief about a particular behaviour). • Ease of Use. • Perceived Usefulness.
Holden (2010)	• Behavioural beliefs (performance outcomes, productivity and efficiency outcomes, patient outcomes, financial, organizational and other outcomes, affective outcomes). • Extrinsic/normative beliefs. • Personal normative beliefs. • Control beliefs (controllability, self-efficacy). • Other beliefs.
Linders (2006)	• Communication. • System quality. • Information quality. • Service quality. • Computer anxiety. • Computer self efficacy. • Computer playfulness. • User interface.
Lin (2010).	• IS Quality (information and system quality). • Organizational support (Top management support).
Lin, McClanahan& Holden (1997),	• Use (number of minutes, number of log-ons, messages sent and messages received). • Subjective satisfaction (understandable, user friendly, easy to

Table 1(b): Extant issues in IS use

be in practical evaluation of mandatory IS use. The types of issue found in the literature are not those encountered in everyday life of IS use.

That this might be so is indicated in Etienne Wenger's vignette of a day in the life of Ariel, a medical insurance claims clerk, found in chapter 2 of Wenger (1998, p.18-34). Her job consisted of taking (paper) claim forms and entering them into the system, but this involved much interpretation and checking prior to the actual entry of data. It was, of course, important to get not only the data right but the information and intention, so that patients and providers (doctors) would receive their due, whether this was what they had claimed for or not. Use of the computer system is, of course, mandatory. Passages are selected below to illustrate DTE issues, and also to indicate how extant constructs cannot always address them adequately. The majority of Wenger's book concerns his notion of communities of practice and his theoretical understanding thereof. While users of a particular IS might be seen to constitute a community of practice, this is not our main interest here. The vignette is used here, not in relation to CoP, but mainly because it provides a very realistic account compiled from careful, long-term anthropological and ethnographic observations, an account that users of mandatory IS like Ariel

would recognise as accurate and appropriate.

3.1 *Illustrations of Down-to-earth issues*

Wenger's vignette can be analysed in terms of the issues above, but doing so loses something – something that is important and meaningful to those involved in the IS use described. Here a number of excerpts are analysed in order to illustrate this claim. Each excerpt is given an identification number.

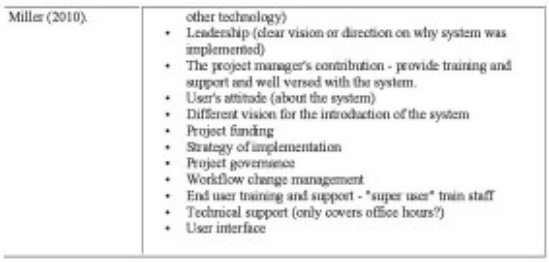
Table 1(c): Extant issues in IS use

P1. "Ariel is well organized … What she tries to do is process easy claims fast during the morning and early afternoon and so get her 'production' out of the way. Once she has reached her daily quota, she uses the last few hours of the day to take care of 'junk' claims and to make phone calls … Ariel does this sorting before leaving so that her pile is ready for the next day". (Page 21)

It is obvious that this organisation of her tasks makes IS use both more tractable for Ariel and more effective for her organisation. How might it be classified under the factors discussed in the extant literature? The nearest in Table 1 is Singletary et al.'s (2002) 'personal innovativeness', referring how she organises her day. But what Singletary means comes from Agarwal and Prasad (1998) as "individuals are characterized as 'innovative' if they are early to adopt an innovation", referring to a technological innovation imposed from outside. Such a concept would therefore be of little help in recognising the importance of Ariel's innovativeness, which is her own. Further, the success of this aspect of her use of the IS is not primarily

due to what she did being innovative, but that she is “well organized” in ways that make sense in her situation of mandatory IS use. The following passage illustrates another factor that would be meaningful to users, the quality of information.

P2. “She enters first the type of service, then the name of the service provider, which leads her into the providers file: there she makes sure she checks that the provider’s address is correct since the insured has ‘assigned’ the benefits to be disbursed directly to the doctor. … Since the patient went to such a ‘preferred’ doctor, Ariel must remember to increase the rate of reimbursement from 80% to 85%.” (pages 22-3)



Miller (2010).	other technology) • Leadership (clear vision or direction on why system was implemented) • The project manager's contribution - provide training and support and well versed with the system. • User's attitude (about the system) • Different vision for the introduction of the system • Project funding • Strategy of implementation • Project governance • Workflow change management • End user training and support - "super user" train staff • Technical support (only covers office hours?) • User interface

Table 1 (d): Extant issues in IS use

Information quality is mentioned by Linders (2006) and Lin (2010) but, to them, it is determined by accuracy, reliability and completeness. There are three reasons why this is not useful in practical evaluation or design, which are illustrated in the passage. First, these are rather static notions when compared with the “makes sure” and “must remember” in this passage. Second, they are more abstract, requiring further explanation as to what should be done during IS use. Third, some information is more important than others, and what determines whether the information is of low or high quality is not whether it is accurate, reliable and complete as such, but the reason why the information is important. The next passage also concerns information quality, again expressed as normative actions rather than attributes, but it does so in three ways.

P3. “She ignores a number of caution messages and moves to the next screen where she checks the address. It is important to make sure the address is correct so the check will reach its destination properly. You definitely will get a void if the address is wrong [which means she would have to enter the claim again].” (page 22)

One is that there are caution messages that are meaningless. The second is that she must act to ensure quality of the address, and the reason is given here. The third is that the system (whether human or technological is not made clear) is designed to prevent bad addresses getting through, which shows that quality of address is serious. This shows the diversity of types of information quality, which the collective term 'information quality' would not disclose. Duplicate information is also a matter of information quality, and Ariel checks this.

P4. "Now that claim looks like a duplicate, but Ariel can't tell from the claim history on-line; she needs to check the original bill to see if the services covered are really the same." (page 31)

The following three passages are about (perceived or actual) ease of use, whichis as diverse as information quality. The first ease of use arises because the data is readily available on the forms and seldom gives any surprises, so certain input actions become habitual.

P5. "The rest of the claim goes fairly fast: enter the code for the diagnosis, for the contract type, skip the coordination section, indicate the assignment of benefits." (page 23)

The second refers to being able to judge beforehand what one needs to do.

P6. "… Of course, you never really know just by looking at the claim how involved it is going to be, because there can be surprises when you open the customer's file on the system. But with some experience, you have a pretty good idea at first sight about how difficult a claim is likely to be". (page 21)

The third is whether the way the system is designed makes it easy to forget the correct date, which reduces ease of use.

P7. "… she has to enter the year the claim is for and the date the claim was received, which was stamped in red by the clerical employee who opened the mail. It is easy to forget to do that because the system enters by default the date of the last claim processed" (page 22)

Here is an extreme example of (not) ease of use:

P8. "Now Ariel realizes that she will need to access information to answer this person's question and that she will not be able to finish the claim she is currently

processing before having to do so. She will have to `clear' out of this claim and thus lose all the information she has already entered. This stupid system, you have to lose all your work every time you are interrupted and that's pretty often." (page 24)

There are many other types of ease of use, which is too general a factor to apply directly in evaluating or designing IS use. Davis (1989) recognises this in that he assumes those who employ TAM will nominate their own set of 'external variables' that feed into perceived ease of use. Yousafzai et al. (2007) have collected together 70 such variables but examination shows that these still are subject to the types of criticism we are making here. Green &Petre's Cognitive Dimensions framework [1996] might offer external variables for ease of use, but they do not extend to the other factors listed above, and below we propose an approach that covers all issues.

P8 (having to lose data) might come under what Adamson & Shine (2003, p.444) call system quality; obviously a system that can access only one record at a time in such usage situations is of poor quality. But 'system quality' as conceived by Adamson & Shine (2003, p.444) would not pick this up, because it is concerned with "software bugs and errors, hardware or facility failures … poor input data quality." The system "must be acceptably secure, accurate and reliable". Often, as here, systems can be used in ways the designers did not anticipate, so there needs to be a certain generosity in design.

In several passages above, ease of use arises from what Singletary et al. [2002] call prior computer experience. Again, we find an issue that is not very informative because it covers too many different things including, as illustrated here, prior experience of judging overall difficulty and that certain portions of data are easy. The following passage shows a different type of prior computer experience: being able to detect the errors or the unusual features that demand special attention, distinguishing them from ordinary information.

P9. "Ariel types and writes impressively fast. Her eyes scan computer screens quickly, knowing what to look for. Check everything on this last screen and press enter." (page 30)

The following is about prior experience, not the computer as such, but about the task, which is creating a story from the data, and not about what is correct but

about what is reasonable.

P10. “You have to develop a good sense of how much is reasonable, juggling the whole thing to produce quickly a reasonable story. What makes a story ‘reasonable’ can’t be taught during the training class. Even her instructors acknowledged that trainees had to learn it “the right way” for now but that, once they got to the floor, they would learn the shortcuts.” (page 31)

The following short sentence exhibits four issues.

P11. “On the computer, she flips through the claim history to get an idea of how this has been handled so far.” (page 27)

Three are found in the earlier list: information quality (Ariel acts to enhance quality of her interpretation), perceived ease of use (she can ‘flip through’), perceived usefulness (the claim history is useful for her to understand). But none of these really express what is important in this use, even when taken together. What really makes her activity ‘successful’ is a factor not mentioned above: she goes beyond what is strictly necessary (the extra work of getting to know the claim history) and it results in better interpretations. Using the factors in Table 1, would both unnecessarily complicate analysis of this short statement and also miss the essential one.

Several examples of what Ram & Jung [1991] call help-seeking behaviour may be found in Wenger’s vignette. The first is quite straightforward, about what information to enter, and is what Ram & Jung had in mind.

P12. “On an ambulance claim, Ariel does not see a diagnosis. She goes over to Nancy, who tells her to find one that would do in the patient’s claim history” (page 30)

In the following, Ariel seeks help, not primarily to know what information to enter, but to obtain advice on what is appropriate and to support her own judgement.

P13. “Then she takes a look at the second void. What? But the patient was seen for headaches. And neurological exams for headaches are considered medical even if there is a secondary psychological diagnosis. Therefore the ‘psych’ maximum [presumably lower than the maximum for ‘medical’] does not apply. She

had actually discussed this case with Nancy and Sheila. She even talked with Maureen, the back-up trainer, who helps people with difficult cases and had agreed with her conclusion." (page 20-21)

The following could be seen as help-seeking behaviour, but it is not about information or how to use the system. It is about seeking to reduce one's workload (justifiably so in this case).

P14. "It is ten to four; Ariel will be leaving in 20 minutes. She decides to stop dealing with her junk and to prepare her work for tomorrow. She goes to Sara, the assistant supervisor, to ask her for some work. When claims arrive at Alinsu, they are opened by the clerical unit and sorted by plans … Ariel pleads for an easy pile, reminding Sara of the difficult work she did in the beginning of the week. Sara gives her a pile from the City Hall … Ariel thanks her: tomorrow she will be able to make production early and then catch up on her junk." (page 33)

While 'help seeking behaviour' might adequately express what is meaningful to an observing researcher, it does not do justice to the diversity of reasons why help is sought. What is important in mandatory IS use is not the behaviour of seeking help, but that help is received from others and what kinds of help are received. Sometimes, help is received without being sought, as in the following:

P15. "Next, she selects the customer's son as the patient from a list of dependents. She is careful because it is easy to choose the wrong dependent; she got voided for this last month. She makes sure the son is under the age of 19. He is not, but there is a recent note from Patty on his file that he is a full-time student. Patty must have investigated it. She is reliable." (page 22)

This would probably be missed by 'help-seeking behaviour'. What is important about the help received is that Ariel does not have to do this work because Patty has done it for her, and that Patty is known to be reliable and what she does can be trusted. Here is another example of help received, which would also be missed because it is accidental and informal:

P16. "… Annette replies, "I think it's 'end of the month'." But Joan corrects her, "No, they just changed it. It was in a memo last week." Ariel overhears the conversation and makes a mental note." (page 31)

Such learning occurs more in those who have an attitude of wanting to do their

best in the work, than in those who couldn't care less. A careless attitude causes trouble for others, as in the following passage:

P17. "In this case, she pays the claim and enters a claim note stating how much has been paid out of the limit so far. In this office, some people are good about notes and some are not. For instance, every time you change an address – something Ariel has already done three times today – you are supposed to enter a note to that effect, with the date and the source of the new address, so that another processor will not put the old address back in. Because not everybody does it, it causes trouble for other people." (page 28)

It might be classified under what Ram & Jung (1991) call complaint behaviour, but that is not entirely appropriate. So might the fact that Ariel exclaimed "What! But …" in passage P13. But speaking about behaviour does not reveal what is important in both these cases, namely the feeling that what others do is unfair or ungenerous. It seems to be an issue that has been overlooked by the literature so far.

This may be classified under complaint behaviour (Ram & Jung 1991). Its importance to mandatory use is not the complaint itself so much as the reason for the complaint. In this case it is that Ariel might feel inconvenienced unfairly or even victimised. So the user turns against the system (combination of technical and human).

P18. "When they hit the key that indicates they are done, the computer system gives them a batch number. If the number ends with a D, no problem, it will just get paid and archived. If the number ends with a Q, the claim must be sent to quality review [which might reject it, and is seen as a black mark against one's work] … She does not know exactly to what degree the appearance of a Q is determined by the type of claim being processed or by the way that she is processing it, but she heard that her supervisor can manipulate the system to send specific claims to quality review. Ariel has been getting a greater number of Qs than usual. As she gets this one, she complains aloud: "What? Another Q? That's terrible!." (page 30-33)

Help received can build up what Ram & Jung (1991) call skill in use, but there are other ways to this, such as learning shortcuts:

P19. "… got to keep processing moving, keep the cost per claim down, but this is

the kind of shortcut you never get in training. Without them, there is no way the job could be done … In training, everything looks so strict and black-and-white. But on the floor, everybody learns the shortcut in order to meet production. For instance, in training, you are taught to start a claim by filling out the forms that will serve as cover sheets for microfilmed records. Yet much of the information on the cover sheets is never used and is redundant with the attached claim record. So experienced processors do not fill out the form completely; they wait until they have completed the entire claim". (page 30)

Finally, the following passage concerns not the mandatory use of the IS as such but about the atmosphere of working.

P20. "There is a problem with the toll-free 800 number … Management has a suspicion that this number was given out by some processors to their acquaintances as a way of calling them free of charge. From now on, all phone calls exceeding fifteen minutes will be marked. Harriet senses the tension that her remark has brought into the meeting and is quick to clarify that the marking of these phone calls does not in itself constitute an accusation. … Still the subject seems delicate, and there is some grumbling and a few defensive remarks." (page 25)

Such factors have an indirect impact on mandatory use, many positive but some negative. It is not clear however how they might be included in the factors listed in Table 1, nor even whether they should be. The mention of 'grumbling' suggests 'complaint behaviour' but this is minor and in no way expresses the main problem, which is located in attitudes of advantage-taking by "some processors" and attitude of suspicion Management.

3.2 *The nature of the problem*

It should be clear that there is a great difference between the issues illustrated in Wenger's text, and the constructs in Table 1, discussed in the IS usage literature. Wenger's issues seem more 'down-to-earth', and we can see immediately and intuitively how they might affect the quality of experience of (M)ISU, at both individual and organisational levels. By contrast, with many extant issues in Table 1 it is less immediately obvious how they might affect the quality of (M)ISU. Why is this? A number of reasons can be adduced.

One problem is that some of the issues are at an *unhelpful level*. These factors relate either to the development of the IS before use, such as 'project risk', or to

the senior management's view of the IS, such as 'Existence of project champion', 'IT-management-process effectiveness' and 'results demonstrability'. Frequently the word 'innovative' indicates an unhelpful level; that something is innovative might be of interest to senior management who wish to enhance their own reputation, but is of little concern to the users (except when it makes work harder for them!). The kind of innovativeness that Ariel displayed in P1, which is relevant to users, is not within Singletary et al.'s [2002] use of the term and would not be of interest to senior management.
That `innovativeness` is meaningful at both levels – albeit in different ways – suggests that issues at an unhelpful level can be 'translated' into a form that is relevant to (M)ISU. Another example is the concept of project champion, who is "enthusiastic and commited individuals to overcome resistence to an innovation and promoting the innovation" might be translated to be someone who is enthusiastic and committed to the use of the system, inspiring others to see that what they are doing is worthwhile and important. If such translations are to be made, a basis on which to make the translation is needed.
'Project risk' is also at the wrong level, being of interest to senior management and IT implementors rather than users. It could be translated to the user context, by removing the word 'project', but this is still unhelpful for a different reason, discussed below.

A second problem is that some factors contain *unhelpful connotations.* Cultural connotations and assumptions within which the researchers or analysts operate, cause the analyst to focus on certain aspects of the situation and overlook others. In IS research the connotations are often technological and organisational. For example, in the literature, 'help-seeking behaviour' is assumed to refer to help with mastering the technology, because IS research is permeated with a central interest in technology in use. By contrast, in the Wenger vignette, help was sought for many other things that are still related to use of the IS, such as:
* to complete a form (P12)
* for vindication and ensuring the appropriate decision (P13)
* to reduce work load (P14)
* to keep to the rules (P16).

What was important to the quality of (M)ISU is not the activity of help-seeking itself but the reason why help is sought. Moreover, it matters little whether the help is sought or whether it is received in other ways, such as by being overheard

(as in P16), in which case alertness and willingness to learn are important issues. To focus on 'help-seeking behavior' might be of interest to psychology researchers but is not, as such, so meaningful to users. The problem here lies in the unspoken technological and organisational connotations attached to concepts within the IS research community, because these restrict what is assumed to be meaningful in a way that does not necessarily reflect the researched situation. A way needs to be found to break open such connotations and assumptions.

A third problem is that of *unhelpful abstraction.* Some issues in Table 1 express something so general that the analyst cannot employ them in evaluation or design, without prior work to imagine the kinds of thing involved. Risk is an example of such an abstraction; risk means "the possibility of loss, injury, disadvantage or destruction" [Webster, 1975]. Since almost any type of thing can go wrong, the analyst would have to know the entire range of things that can go wrong before 'risk' is a helpful issue. It is seldom that such a condition is met, even when restricted to a particular context. All analysis involves abstraction of some degree; helpful abstraction is that which helps in sharply highlighting issues that are important to (M)ISU while unhelpful abstraction remains too general and depends on the analyst instantiating the generic issues from either an external list or their own experience before they can be useful. A way needs to be found to abstract from idiographic narratives to something precise in meaning. In P15 above we see Ariel trying to minimise risk (as researchers would put it) but it is very specific risk: of being voided. To Ariel, it is not risk as such that is important, but being voided.

The fourth problem is *unhelpful combination.* Some constructs express multiple types of issue. For example, computer self-efficacy expresses the ability to perform tasks successfully despite challenges. Not only is this not an easy term to explain, but it depends on several kinds of thing, illustrated by P4:
* the kind of challenge (possibility of duplicate claim);
* how important the task is (ensure appropriate payment, and prevent double payments);
* the process of surmounting the challenge (search for the original claim);
* willingness to make the extra effort to do this.

If these are fully specified, the difficulty for the analyst, during evaluation, is simply to remember and properly understand them all. The difficulty is increased enormously when, as is usual, the components of the combination are unspecified.

A way needs to be found to separate out the issues that are meaningful in distinct ways, but without becoming overloaded with detail.

Finally, there are important issues that are *missing* from the literature, at least up to the present time. In Wenger's vignette, P20 expresses attitudes of advantage-taking and suspicion, which affect the ISU. Attitude in particular is difficult to observe and measure (positivist research) or interpret (interpretivist research), and perhaps for that reason is seldom discussed in academic literature on (M)ISU. The literature will always miss things; for example, until Davis published his groundbreaking (1989) thesis on TAM, the human factors community focused on ease of use and ignored usefulness. A reliable way is needed to discover and think about issues that are often overlooked during practical evaluation.

3.4 *Towards a new approach*

At the root of all the problems described above is meaningfulness. DTE issues are those that are meaningful to users and the situation of use, including all its stakeholders. Each of the above problems may be seen in terms of meaning:

* Unhelpful level: Some extant issues are meaningful to the wrong people or roles, and not to users.
* Unhelpful connotation: Some extant issues are narrowed to their technological (or other cultural) meanings.
* Unhelpful abstraction: Some issues are too broad in their meaning.
* Unhelpful combination: Some issues combine multiple meaning that should be separated out conceptually.
* Missing: Some of what is meaningful in the situation of ISU is overlooked.

However, the problem that immediately faces us is the diversity of DTE issues, which seems limitless. Is it not unreasonable to expect researchers or analysts to think of them all? Many DTE issues depend on the specific situation and its specific context, the combination of which is unique. To approach DTE issues idiographically, as a plethora of individual instances would be too unwieldy and yet still omit many issues that are not meaningful to us. There needs to be some generality in the approach. But on what may generality be based?

There is a different approach to generality, which might provide a way forward: one that directly focuses on meaningfulness. The groundwork for this approach was laid out inthe philosophical investigations of the late Herman Dooyeweerd (1894-1977).

4. *The contribution of Dooyeweerd's notion of aspects*

Basden (2008a) has suggested that IS use may be understood by reference to a suite of fifteen aspects initially proposed by Dooyeweerd [1984/1955], and suggested that, in principle, this suite of aspects should be able to cover all that is meaningful in IS use. It is proposed here that a Dooyeweerdian approach can both explain most of the ways in which the extant factors are unhelpful, and provide a way to reveal, study and discuss DTE issues such as are portrayed in Wenger's vignette.

Table 3. Dooyeweerd's Aspects: Meaning, Good and Bad

Aspect: (Meaning)	**Example Functioning (Good / bad)**	**Example Repercussions (Benefit / Detriment)**
MATHEMATICAL ASPECTS		
Quantitative aspect (Discrete amount)	Being-amount	Numeric order
Spatial aspect (Continuous extension)	Spreading	Simultaneity
Kinematic aspect (Flowing movement)	Moving	Dynamism
PRE-HUMAN ASPECTS		
Physical aspect (Fields, Energy, mass)	Causality	Persistence
Biotic/organic aspect (Life, organism)	Life functions	Health, Growth
Sensitive/psychic (Sensing, feeling, emotion)	Sensitivity	Interaction with world
HUMAN ASPECTS		
Analytical aspect (Distinction, concepts Abstraction, logic)	Distinction / Blurring	Clarity / Confusion
Formative aspect	Planning,constructing /	Achievement /

Table 2(a). Dooyeweerd's Aspects: Meaning, Good and Bad

Grounded in a presupposition of creation, fall and redemption [Dooyeweerd 1979] Dooyeweerd held that all that occurs in the world, whether human, social or 'natural', is constituted in responses to diverse kinds of law (such as physical law, which is more determinative, and lingual, social and juridical law, which are non-determinative), that each different kind of (non-determinative) law defines a different kind of 'good' (or success or benefit; for example communicational good differs in kind from justice or generosity), that this law that has the character of promise ("If you do X then Y is likely to result"), that outcomes of what occurs are the combination of the results (Ys) of different kinds. Each kind of law ('law-sphere') is expressed in temporal reality as different aspects thereof. The desirability of outcomes is defined by reference to the innate norms of law-spheres, but achieving a given outcome involves human functioning across their whole range, and cannot be predicted nor fully controlled. However, Dooyeweerd held that when we function well in all aspects then the outcomes are likely to be healthy and beneficial in many ways, and this provides an approach on how to

understand the implications of IS use. Moreover, each different basic kind of law is a kernel that also determines a distinct way of being meaningful.

Dooyeweerd delineated fifteen distinct aspects, or law-spheres, summarised in Table 3. It can be seen that they cover both natural,

(Deliberate shaping, Technology, skill, history)	Laziness	Mess
Lingual aspect (Symbolic signification)	Truth-saying / Deceit	Understanding / Misunderstanding
SOCIAL ASPECTS		
Social aspect (Relationships, roles)	Respect, Friendship / Hostility	Organisations / Enmity
Economic aspect (Frugality, resources, Management)	Frugality / Profligacy	Prosperity / destitution
Aesthetic aspect (Harmony, delight)	Orchestration / Frenzy	Beauty, Fun, Interest / Grotesqueness, Boredom
SOCIETAL ASPECTS		
Juridical aspect ('Due', appropriateness; Rights, responsibilities)	Responsibility, appropriateness / Oppression, inappropriateness	Justice / Injustice
Ethical aspect (Attitude, Self-giving love)	Generosity, humility / Selfishness, Greed	Goodwill / Defensiveness, More greed
Pistic/Faith aspect (Faith, commitment, belief, Vision of who we are and what is meaningful)	Belief, Loyalty / Disloyalty, Idolatry	Trust, Dignity / Distrust, Decline

Table 2(b). Dooyeweerd's Aspects: Meaning, Good and Bad

human-cognitive, social and societal issues. This offers a way to link individual, DTE experience of IS users with organisational outcomes.

This provides a way of seeing the 'down-to-earth' issues, those issues that are meaningful to IS users and others, as diverse and meaningful and yet also constitutive of resultant quality of (M)ISU. Analysis involves separating out these aspects of any situation (e.g. of (M)ISU), both of the way in which users function and of the resultant outcomes.

The reader might justifiably ask why it is appropriate to consider Dooyeweerd. There are a number of reasons. The most important practical reason is the wider coverage of Dooyeweerd's aspects. Many suites of aspects have been proposed, though under diverse terminology, including Hartmann's [1951] strata, Bunge's [1979] systems levels, Habermas' [1986] action types, Maslow's [1943] needs. All these may be seen as specialised subset's of Dooyeweerd's aspects. This means thatDooyeweerd's suite is the most comprehensive.
In addition, Dooyeweerd's notion of aspects is richer, in that to him aspects are not merely categories or strata, not merely types of thing or system, not merely types of action, not merely types of need. They are spheres of meaning and law,

from which these may be derived. Being spheres of meaning, they provide a set of ways in which things may be meaningful, and hence a multi-aspectual 'lens' with which to view situations. Being spheres of law, they have an important normative component, enabling the analyst who employs them to address issues of good and bad, in addition to types of thing or activity. Dooyeweerd's suite is directed towards everyday human experience rather than being an ontological theory. It is the outcome of a lifelong reflection not only on his own experience, but also on what thinkers have written over the past 3000 years. Finally, Dooyeweerd proposed philosophical tests for candidate aspects, especially the method of antinomy. Despite this, he was always cautious about claiming any 'truth' for his suite, recognising that every suite must be open to amendment.

This is perhaps why Dooyeweerd's aspects have proven useful in many areas (for example, de Raadt 1989; Bergvall-Kåreborn&Grahn 1996; Winfield, Basden&Cresswell 1996; Eriksson 2001; Bergvall-Kåreborn 2001; Basden 2002a; Mirijamdotter&Bergvall-Kåreborn 2006; Basden& Wood-Harper 2006; Basden 2008a, Basden& Klein 2008; Basden 2010). They were designed primarily with the everyday, pre-theoretical attitude and experience in mind, but can be used as tools for theoretical analysis since theoretical analysis itself is part of the everyday reality that is governed by the aspects. They are aspects of everyday life, and this makes them admirably suited to understanding down-to-earth issues of IS use.

5. *A Dooyeweerdian account of unhelpfulness*

Here we explore how Dooyeweerd might account for the problems discussed above, and offer ways of overcoming them.

That some issues are at an *unhelpful level*, focusing on what is meaningful to parties other than those involved in the day-to-day use of the IS, may be accounted for by Dooyeweerd's recognition that all human beings function in the pistic aspect and hence will commit themselves to some origin of meaning. Origin of meaning can either be the entire range of aspectual meaning, as in everyday life, or can be narrowed down to a few or, in the case of reductionistic tendencies, to just one aspect. In many cases, the origin of meaning is determined by our role; for example senior management tends to focus on economic aspect (profits) and pistic aspect (reputation) and ISD project managers focus on formative aspect (technology) and economic aspect (budgets, deadlines). By contrast, in everyday life all aspects are important in principle. Even if individual users focus on certain aspects, the wide variety of users will ensure that most aspects are active. So the

analyst needs to be aware of all the aspects at once, and not only those that happen to be important to their own research or to managers or IS developers.

Translation from the unhelpful, role-dominated level, to the everyday life of users can be assisted by Dooyeweerd's aspects because, Dooyeweerd claimed, all human functioning occurs in response to a single common suite of aspects – the researcher, the manager, the IS developer, the user and all others. Translation may be effected by identifying which aspect mainly makes the unhelpful level issue meaningful, and then asking in what ways that same aspect might be meaningful in the user situation. For example, project champion is mainly of the pistic aspect (vision, commitment). The earlier suggestion of translating to a person who believes in the ISU and encourages others to do so, arose from asking how the pistic aspect might be important in maintaining high quality (M)ISU.

That issues might contain *unhelpful connotations* can likewise be accounted for by reference to certain meaning-spheres (aspects) being elevated and others overlooked. For example, the target of help-seeking behaviour can be issues that are meaningful in any sphere. But IS researchers, by being more acutely aware of the importance of technology (formative aspect) tend to more readily interpret this as help with technology. In Wenger's vignette help is sought or otherwise received for things that are meaningful in other spheres, such as:
* completion of form (P12): lingual
* vindication and ensuring the appropriate decision (P13): pistic with juridical
* reducingworkload (P14): economic
* to keep to the rules (P16): juridical.

That one can expect a variety of aspects in the situation of (M)ISU comes from Dooyeweerd's aspects being all present in the pre-theoretical engagement with the world, which is characteristic of (M)ISU.
Such targets of help, of or any other human behaviour, can be differentiated fairly easily by the aspects, without this becoming too onerous. The cultural connotations embedded in an extant concept can be made less problematic by first identifying which aspects they emphasise and then retargeting the concept towards the other aspects.

That some issues are *unhelpfully abstract* is accounted for, not by reference to abstraction as such, but to abstraction of multi-aspectual phenomena. (Abstraction is recognised by Dooyeweerd as central to research, and he

discussed the conditions under which it is possible and valid [Basden 2011].) Under Dooyeweerd's approach, most phenomena are qualified by a single aspect (for example, justice is juridical) but there are a few that cross all aspects (functioning, possibility, good, bad, knowing, being). Risk is one of these in that "the possibility of loss, injury, disadvantage or destruction" [Webster, 1975] includes not just one but two multi-aspectual concepts: possibility and bad. However, in P15, risk of being voided is very specific: voiding means a black mark against one (pistic aspect) and a lot of extra work (economic aspect). It is not risk as such, but the pistic and economic aspects that are of most importance to Ariel in her MISU. So, in abstracting from the idiographic narrative or situation, the analyst should not be content with abstraction as such but should always ask themselves whether the concepts or constructs that have been abstracted are sharply meaningful in one or perhaps two readily identifiable aspects, which have meaning to those being researched.

That some issues are *unhelpful combinations* may be accounted for by Dooyeweerd's understanding of human activity as always involving all aspects. So when the analyst tries to fully analyse human activities they are likely to find a confusing host of aspects. Thus for example 'computer self-efficacy', as the ability to perform tasks successfully despite challenges, involves not only the following aspects:
* kind of challenge: analytic aspect;
* how important the task is: juridical aspect;
* the process of surmounting the challenge: formative aspect;
* willingness to make the extra effort to do this: ethical aspect
but more besides, such as self-confidence (pistic aspect), the excitement of some challenges (aesthetic aspect) and their nuisance value (economic aspect).

When faced with unhelpful combinations, it is useful for the analyst to separate out the distinct aspects of that activity, by asking what is meaningful to those being researched. One way to do this is to ask the researched about each aspect in turn, but that proves to be rather stilted and, though better than some extant approaches, fails to elicit the tacit knowledge that is important to the success of the work activity and is the taken-for-granted knowledge of the community of practice [Wenger]. Instead, it is preferable to approach the researched with questions and encouragement that help them to open up and express all that is meaningful to them, while the analyst has, at the back of her/his mind, an

awareness of aspects, and then analyse what is said by reference to aspects. This approach is the main topic of Ahmad &Basden [2011].

That some issues are *missing* from consideration in the literature may be accounted for by saying that the research community has not yet found the aspect important. Dooyeweerd's suite of aspects aspires to complete coverage of all possible distinct kinds of meaning and, though Dooyeweerd himself held that no suite "may lay claim to material completion" [Dooyeweerd 1955,II:556], nevertheless it seems more complete than most competing suites. So Dooyeweerd's suite may be employed in checklist mode, to identify those spheres of meaning that are emphasised in the literature and those which are ignored. This is better carried out informally, with the researcher being always alert to which aspects are being given more emphasis and which, less. For example, the importance of attitudinal and pistic aspects, expressed in attitudes and deep beliefs makes the researcher more aware of attitudes of the management in Wenger's vignette.

6. *Discussion and conclusion*

This paper suggests a new approach to studying (mandatory) IS use, using Dooyeweerd's aspects (spheres of meaning) to reveal and understand down-to-earth (DTE) issues, which determine the quality of (mandatory) IS use. What is down-to-earth cannot be precisely defined because down-to-earth implies highly diverse and intuitive. Instead, it has been illustrated by a vignette from Wenger's [1998] discussion of communities of practice. Barki [2008] suggests that constructs should be seen, not primarily as predefined attributes of a situation, but as arising from and constituted in actual human behaviours in the situation. A number of differences have been identified between the DTE issues illustrated there, and the extant issues. While a few of the extant constructs might be DTE, most of them tend to be unhelpful in their level, connotations, abstractions or combinations and even so important issues are overlooked.

The proposal here is to employ Dooyeweerd's aspects as a lens with which view (M)ISU. While use of conceptual lenses is common in interpretivist IS research, those lenses are often theoretical and uni-aspectual (for example, when Adam et al. [2006] explicitly uses gender and technology theory as a lens) and often result in narrowed views. By contrast the lens offered by Dooyeweerd's aspects is diverse and oriented to everyday intuition, and thus uniquely suited to DTE issues. By means of this it enables the analyst to be open to a wider range of

down-to-earth issues than do theoretical approaches. As suggested above, the various types of unhelpfulness discussed above may be avoided in the following ways, by analysing which aspects make concepts meaningful and, where necessary, taking the following actions.

* To avoid unhelpful level, the analyst should check to what extent concepts that emerge are meaningful mainly to themselves, managers or IS developers rather than users. If so, these might be translated by identifying which aspect makes them meaningful, and then asking in what ways that same aspect might be meaningful in the user situation.
* Unhelpful connotations can be avoided if the analyst recognises which aspects their own community tends to emphasise and then retargeting concepts they identify towards the other aspects.
* To avoid unhelpful abstraction, the analyst should ensure that concepts that have been abstracted are sharply meaningful in one or perhaps two readily identifiable aspects, to those being researched, rather than being general.
* Unhelpful combinations can be avoided if the analyst looks, not for things (events or behaviours or structures) but for the way such things are meaningful and normative to those being researched.
* Missing issues may be highlighted by employing Dooyeweerd's suite of aspects in checklist mode, to identify those spheres of meaning that tend to be ignored.

These principles may be applied to extant constructs, and Joneidy & Basden (2011) in this volume shows some of them in action. They might be more effective however if applied directly to qualitative analysis of the usage situation, as explored by Ahmad & Basden (2011). That approach does not begin with extant concepts, but suggests uncovering what is meaningful to users in their everyday IS use by reference to Dooyeweerd's aspects.

The argument in this paper has, of necessity, been indicative rather than exhaustive. Therefore, more discussion of this kind is needed, as critique and possibly to refine the approach. Nevertheless, it opens up a new approach. Dooyeweerd provides a philosophical underpinning for not only understanding the nature of DTE issues, nor just showing their diversity, but also for explaining why the notion of DTE issues is needed for analysis and understanding of IS use.

This paper has not, however, provided empirical evidence of the validity of this approach. Some initial evidence is provided by two other papers in this collection. Joneidy&Basden [2011] employ Dooyeweerd's aspects to examine extant

constructs identified in IS research and collected by Yousafzai [2007]. That approach presupposes the extant concepts and provides incremental improvement on the current scientific position. Ahmad &Basden [2011] introduce a new way of approaching (M)ISU, a new paradigm. Instead of taking existing constructs, they use Dooyeweerd's aspects to investigate directly the situations of (M)ISU to get behind what is expressed and to reveal hidden issues.

Though this paper has restricted itself to MISU in organisations, the aspectual approach might be extended. First, there is nothing in the approach that presupposes ISU is mandatory; so it might be extendible to understanding issues of voluntary IS use. Second, there is nothing that presupposes the users are in an organisational setting; so it might be extendible to non-organisational use, both individual use at home and global use. This suggests this Dooyeweerdian approach might be useful in understanding the less traditional versions of IS use, such as social networking, blogging, wiki'ing and game-playing. Such use is likely to be even more characterized by down-to-earth issues than is mandatory organisational IS use.

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IIDE Proceedings 2011 ~ Vol.2 ~ Down-To-Earth Issues In

(Mandatory) Information System Use: Part II – Approach To Understand And Reveal Hidden Issues

Abstract:
This paper proposes a new way of approaching mandatory information system use (MISU) to understand and reveal hidden issues which are meaningful in everyday life of system users. We call these Down-to-Earth (DTE) issues, and they are better at providing guidance for information system evaluation. Case study research in using information system was conducted on system users to demonstrate how DTE issues are formed. Unstructured interview was used as the main data collection method. Results show that the new way helps to understand in depth and reveal the hidden issues, which makes this approach more practical for system evaluation.

Keywords:
Down-To-Earth, Mandatory Use, Dooyeweerd's aspects

1. *Introduction*

Information systems (IS) used in the organisation are seen to provide benefits in terms of increased productivity, and improved strategic positions and daily operations (Yoon & Guimaraes, 1995). Such benefits though are at the organisational level, whereas at the individual level, the system can provide benefit in helping individuals to complete job tasks and obtain evidence for decision making. To evaluate the benefits especially to individual system users it is important to look for meaningful issues in everyday life working experience (Basden, 2008).

Basden and Ahmad (2011) emphasize `meaningful issues' in mandatory IS use (MISU), describing them as Down-to-Earth (DTE) issues. DTE issues are sensible and practical for system evaluation because they are specific in their context and easily understood by system users. Current debate in the field discussed the

contrast between DTE issues and extant issues. Examples of extant issues are perceived ease of use and perceived usefulness (Davis, 1989; Shih & Huang, 2009), IS quality (Lin, 2010; Linders, 2006), management support (Chang, et al., 2010; Lin, 2010; Rouibah, et al., 2009; Shih & Huang, 2009) or computer self-efficacy (Adamson & Shine, 2003; Linders, 2006; Singletary, et al., 2002). Basden and Ahmad (2011) argue that, in providing guidance to practical evaluation of IS use, such extant issues are unhelpful in several ways: unhelpful level, unhelpful connotation, unhelpful abstraction, unhelpful combination, as well as missing many important issues.

'Unhelpful level' refers to issues that might be of interest to senior management, IS developers or researchers but have little direct meaning to users. Here, 'users' not only refer to direct users. They include all those involved in tasks and activities that in some way relate to the IS in use. Users are seen as social actors (Lamb & Kling, 2003), not just as individuals. 'Unhelpful connotation', on the other hand, refers to unspoken meaning imposed on concepts because of the cultural assumptions of researchers which differ from the assumptions made by users. 'Unhelpful abstraction' refers to issues that are too general, such as 'risk'. Next, 'unhelpful combination' refers to issues that combine several important meanings that could and should be separated. Lastly, 'missing' issues refer to those that happen to have been overlooked by extant discourse because it has not yet recognised their importance even though they have been important to users.

Basden and Ahmad (2011) suggest that, instead of trying to understand IS use in such terms as above, we should do so in DTE terms. Unfortunately, DTE terms cannot be defined precisely since many of them are intuitive, but Basden and Ahmad (2011) illustrate them by using Wenger's (1999) passage in vignette of a day in the life of Ariel, a data entry clerk. An example of Wenger's passage,
"She enters first the type of service, then the name of the service provider, which leads her into the providers file: there she makes sure she checks that the provider's address is correct since the insured has 'assigned' the benefits to be disbursed directly to the doctor. … Since the patient went to such a 'preferred' doctor, Ariel must remember to increase the rate of reimbursement from 80% to 85%." (pages 22-3).

Analysis of this using extant literature might focus on perceived ease of use (Davis, 1989) or IS quality (Linders, 2006) for example, whereas to Ariel the important DTE issue is making sure she remembers something so that

appropriate payment is made, and ease of use or IS quality merely help or hinder her in this. Basden and Ahmad (2011) suggest that the issues may be understood by reference to Dooyeweerd (1955), to a suite of fifteen aspects that are meaningful in everyday activities of system users and would suggest that the real issue of appropriateness is of the juridical aspect. However, Basden and Ahmad (2011) do not show how they obtain DTE issues in practical analysis. This is the purpose of this paper. The aim is to propose and discuss a new way to understand and reveal DTE issues in mandatory information system use (MISU) by system users.

The remainder of this paper is organised as follows: the research background covers how the extant constructs were formed and how they were analysed, research method used, attempts to use Dooyeweerd's aspects, the findings and lastly the discussions and conclusions.

2. *Research background*

One way to overcome the unhelpfulness of extant issues is to try to reconceptualise them. Barki (2008) suggests four ways to do this, and Joneidy and Basden (2011) attempt that using Dooyeweerd's aspects to reconceptualize extant constructs. This paper explores a different approach: to bypass extant issues altogether and find a method to analyse situations of IS use directly in a way that surfaces the DTE issues. To prepare for this requires understanding of qualitative research and why extant issues are unhelpful.

2.1 *Review how the main contructs were formed*

The extant issues (constructs) used in research by current researchers do not take into consideration the everyday working life experience of system users (Basden & Ahmad, 2011). Examples of studies not using issues based on what IS users think is important include those carried out by Chang, et al. (2010), Lin (2010), Shih and Huang (2009), Rouibah, et al. (2009) who use survey to test hypotheses about the relationship of issues towards IS usage. However, their issues were chosen issues by the researchers rather than being meaningful to users. In many cases, the chosen issues are based on previous research rather than on why such issues are important from the perspectives of users. For example, Yoon and Guimaraes (1995) emphasise the issue of management support but this has already been emphasized as important by other authors. Previous research also included issues used by Davis (1989) to develop his Technology Acceptance Model (TAM), perceived ease of use and perceived

usefulness.

The original source of issues is itself usually using prior theory. This is shown in the following examples:
* Constructs in Venkatesh et al.'s (2003) Unified Theory of Acceptance and Use Technology (UTAUT) model come from eight theoretical models, including Davis' (1989) Technology Acceptance Model (TAM).
* Intention to Use construct of TAM comes from Fishbein & Ajzen's (1975) Theory of Reasoned Action (TRA), which comes from psychological theory.
* The Perceived Usefulness and Perceived Ease of Use constructs, important as determinants of user behaviour as several theories indicate, include behavioural decision theory, self efficacy theory and adoption of innovation (Davis, 1989).
* The self efficacy in the Social Cognitive Theory (SCT) comes from theory of human behaviour (Compeau & Higgins, 1995).

Constructs that are based on theory are limited for two reasons. One is that theory limits itself to one or a very narrow range of aspects (ways in which reality is meaningful). The other is, as Clouser (1991, p. 51) explains, "once theories are formulated, tested and accepted by experts, they become the most authoritative standard for judging the truth of whatever they are about", which further restricts research to the narrow range of aspects. Constructs based on such a narrow view are not adequate for revealing DTE issues, because DTE issues cover a very wide range of aspects of IS use and in trying to reveal them researchers should not be restricted by what is currently deemed authoritative. Instead, to reveal DTE issues requires a more intuitive approach, but one that is systematic.
Because extant issues are narrower in their scope than everyday life is, those who work with them find they must always keep adding other significant issues (e.g. 'external variables' added to Davis' (1986) TAM) to enhance the explanation of the actual usage (Shih & Huang, 2009). A Meta analysis of the TAM by Yousafzai et al. (2007) showed about 70 constructs have been suggested to be included in the study of using TAM. With 70 constructs, the model becomes unwieldy and many of them overlap with others (Ahmad & Basden, 2008; Joneidy & Basden 2011).

2.2 *Qualitative research and interviews*
Quantitative methods such as survey with statistical analysis have been well established and widely used in research on issues relating to IS use (Trauth, 2001). But the quantitative ways of doing research only suit situations where

sample size is large in order to generalize results to a large population. By contrast qualitative research focuses on a particular situation in detail (Myers, 2009, p. 9). Thus, investigation of human experience can best be done using qualitative methods (Polkinghorne, 2005, p. 2).

Myers (2009) states that, "If there is one thing which distinguishes humans from the natural world, it is our ability to talk! Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live". This study is qualitative in its nature and the empirical data was gathered based on unstructured interviews with direct users rather than those at management level. This is because the majority at management level is not using IT frequently (Mahmood, et al., 2001) but indirectly via IT output produced by other people (Ang, et al., 2001).

The interview (or inter-view) is an exchange of views between two people talking about the common interest, one of whom is in the role of researcher (Kvale, 1996). Interviews allow the researcher to obtain better understanding of users' everyday experience since people will have a variety of opinions, thinking and the rationale as to why they did certain things (Myers, 2009). They help to obtain the interviewee's views and experiences in his or her own terms (Kaplan & Maxwell, 1994). Furthermore, a lot of data can be obtained from different angles and different types of questions can be answered by interviewees since different people will give different views (Myers, 2009). Also, through interview the researcher can approach the interviewees face to face and can clarify issues that are not clearly understood.

Open interviews encourage two-way communications rather than only one way as when questionnaires or structured interviews were used. Conversation can `give a feel' (Watson, 1987, p. 53) on situations being studied. Conversation with system users, who directly experience use of the system, is the best way to gain understanding of everyday life activities of individual user. "Experience has a vertical depth, and methods of data gathering, such as short-answer questionnaires with Likert scales that only gather surface information, are inadequate to capture the richness and fullness of an experience" (Polkinghorne, 2005, p. 2). For these reasons, interviews are used in this study in order to uncover and understand the DTE issues of MISU, with questions designed to open up the users' everyday experiences.

2.3 *Interpretive and qualitative analysis*

There is a wide range of literature that documents the procedures associated with

analyzing qualitative data. Many of these are associated with specific approaches or traditions such as grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1990), narrative analysis (Alvarez &Urla, 2002) and phenomenology (Wojnar & Swanson, 2007). However, DTE issues present particular challenges.

One of these is multiple meaning. Klein & Myers (1999) publish principles for interpretive IS research. Principle number six states the importance of multiple interpretations: "the different interpretations among the participants as are expressed in multiple narratives or story of the same sequence of events under study". For DTE issues, however, it is not enough simply to collect multiple narratives because what people say does not always express all that is meaningful, and there are meanings hidden behind what they say that needs to be brought out. For example, when interviewing users on the issue of `support from supervisor', the replies received might express complaints (or praises) but these might be limited to those that happen to be going round the situation of system use, while other issues related to this are left unspoken for various reasons. This is illustrated by Holden (2010), based on interviewees' feedback such as "I can very quickly get the nuggets of information that I need, versus … looking around and asking the personnel on the floor, `Where is the old chart?'." The researcher interpreted the statement as "Immediate access to information to speed up work", but many issues remained hidden, such as relationships in the workplace and why nuggets of information are useful.
Current ways of conducting data analysis are through indentifying themes, formed directly from what is said by the interviewee, even though the issues that emerge at the end of the process might be abstractions from them. Jain and Ogden (1999, p. 1597) explain a typical process.

The interviews were audio taped and transcribed. The transcripts were read several times to identify themes and categories as recommended by Miles and Huberman (1994). In particular, all the transcripts were read by AJ and a subsample was read by JO. After discussion a coding frame was developed and the transcripts coded by AJ. If new codes emerged the coding frame was changed and the transcripts were reread according to the new structure. This process was used to develop categories, which were then conceptualised into broad themes after further discussion. The themes were categorised into three stages: initial impact, conflict, and resolution.

One problem with this kind of process, combining themes to make up sub-themes,

is that it does not help to understand the multiple meanings of what have been said by interviewer. So a method of analysis is needed that is able not only to encourage the IS users to express their concerns openly but also to find the multiple meanings hidden behind what they actually say.

3. *Research methods*

This research seeks to gather as many user's DTE experience as possible. Ten direct users participated in this study, in particular those who used the system directly for job completion and have been working with the organisation since the system was implemented in 2007. They were selected from among the middle and lower level staff since they used the system everyday. Managerial staff only used the system once in a while when they need it for reporting purpose.

3.1.*The interviews*

Interviews were conducted on these direct system users in a public service organisation under Local Enforcement Agency responsible for ensuring development and services to the community living within their authority. The type of system involved in this study is a system that captured the business process activities. Users have no choice but use the system to complete their job tasks (i.e. mandatory IS). Appendix 1 contains a brief description of the systems they used known as Local Government Information System (LoGIns), Financial Information System (FINIS) and Assessment and Valuation Information System (AVIS).

The interview must allow the researcher to obtain ideas and feelings from users and enable both parties to discuss meaningful issues. The types of questions asked during the interviews were rather unstructured, more so in the full study than in the pilot study. The type of questions put to interviewees is important, so that they will not just say `Yes' or `No' but feel encouraged and stimulated to open up about what they find meaningful to them in their everyday work.

3.2 *The pilot study*

A pilot study was conducted to help decide who should be interviewed, how much access to the organisations the researcher was able to gain and to prepare the schedule (Avison& Myers, 2005). It also helped the researcher to expose herself to the organisations, enabled the research design to be reviewed, and to create a good relationship between those who will be involved in the study. The impression during first meeting is important to convince interviewees what benefits they can

gain for their cooperation and assure them that there will be no effect if they refuse to cooperate. The pilot study also exposed the researcher to the types of system used in the organisation. The data collection aim was to get the overall idea of what sort of information the researcher can obtain and what types of questions are useful. The people involved during interview were one IT Officer and three system users. Three main things were learned during the pilot study, namely
(1) change for the full study,
(2) informing the process, and
(3) contributing to the results of the research.

First, most of the questions asked were related to the user interface and system performance and related to input and output processes. Basden (2008) calls this human computer interaction (HCI). And, how system usage affected their lives Basden refers to this as human living with computers (HLC). The latter description is considered more important in IS use. Second, the interview sessions were conducted in front of users' computers while the interviewees continued doing their job, so full concentration was not possible during the interview sessions. There were interruptions from other staff, as well. Third, the questions were explicitly designed to try to cover all of Dooyeweerd's aspects of the IS use, but this proved to be a constrain rather than stimulate the conversation, contrary to by Kane's (2006) finding; see below.

3.3 *The main study*
The main study changed the scope of these three. Questions focused more on HLC matters, such as how family issues affected their work flow and how they handled personal matters, if any. Each interview session was conducted in a separate area or room so that the interviewee remained focused on matters discussed with the researcher as they share their experience about using the system. Also, this helped avoid any influence from either their superior or colleagues that might affect what the users would like to share. Except as discussed below, Dooyeweerd's aspects were hardly used during the interview process, but kept at the back of the researcher's mind only to ensure aspects were not overlooked by the researcher.
The interviewees' opinions are important to clarify their experiential life as "it is a life-world where they lived, felt, undergone, made sense of, and accomplished" (Schwandt, 2001, p. 84). Therefore, in both stages of data collection, the

researcher encouraged the interviewees to express their own opinion that reflected their experience in the past. This also helped in not losing the richness in explanation and interpretation.

3.4 *The transcription process*

The interviews were conducted in Malay. Translation process was carried out for the transcriptions to be translated to English language directly from the tape recordings. The sentences were translated by sentences. Example 1 shows how the translation process was done. Each sentence was translated from Malay to English.

Example 1 – Malay language:

Question: Sudah berapa lama menggunakan sistem?

1. *Guna system baru sebulan. Sebelum bahagian lesen saya kerja di bahagian penilaian.*
2. *Saya guna system LoGInS untuk semua berkaitan dengan permohonan lesen. Masa itu saya guna AVIS.*
3. *Sebelum kunci masuk, kena pastikan borang cukup dan dilampirkan sekali serta di sahkan.*
4. *Juga RM10 sudah dibayar oleh pemohon sebagai servis perkhidmatan. Saya tengok pada resit.*
5. *Kalau yang lebih RM10, ianya campur sekali dengan jenis lesen lain. Contoh untuk lesen sementara.*
6. *Bagi yang permohonan baru saya kena buka fail. Lesen ini hanya untuk setahun. Setiap tahun kena mohon.*
7. *Selain kerja ini, saya juga buat kerja lain dari arahan boss.*

English language – Question: How long have you been using the system?

1. *Used it for about one month. Before working with licence department I worked at valuation department.*
2. *I use LoGInS for everything related to business license application. That time I used AVIS.*
3. *Before keying-in into system, must ensure enough documents and attached together and certified, as well.*
4. *Also RM10 processing fees have been paid by applicants for services rendered. I refer to the receipt.*
5. *Ones which exceed RM10, are combined with other types of licences. Such as for temporary license.*

6. *For new application I need to open a file. This license is only for one year. Every year will have to apply*
7. *Other than this task, I also do other work instructed by my boss.*

4. *Attempts to use Dooyeweerd's aspect during interviews and analysis*

This exploratory research aims to apply Dooyeweerd's fifteen aspects to gain a deeper understanding of users' everyday life experience and reveal meaningful issues in their use of information system (Basden, 2008). Dooyeweerd's suite of aspects is explained in Basden & Ahmad (2011). The term 'aspects describes "a way in which a thing may be viewed or regarded; interpretation" (Dictionary.com). The word 'thing' in this research refers to users' everyday life experience in using information system.

This section will cover how aspects were used to help in obtaining DTE issues. Researchers cannot assume that what users verbally say is relevant and what they did not say is irrelevant because users might overlook some important issues. There were two stages: interview and analysis. Dooyeweerd's aspects were mostly used during the analysis and as background guidance only during most interviews.

4.1. *Approaches during interviews*

The interviews started with the researcher's background and continued with explanation about the purpose of the interviews and links with the research. Then the researcher focused on user's general background such as educational background, family background and the reasons for joining the organisation. This puts them at ease when sharing their experience. The researcher used four different tactics in the order shown below during the interview sessions to probe and discover meaningful issues in each individual user.

* First – developed questions based on Formative and Social aspects for the introduction part of the session.
* Second – showed a list of Dooyeweerd's aspects.
* Third – approached the questions based on what is shared by interviewees, not based on aspects
* Fourth – applied Dooyeweerd's aspects in the back of her mind after interviewees finished haring their experience on one issue to guide them to other issues if necessary.

These four tactics were used in combination with each other when the researcher

conducted the interviews. They might be used in any sequence, though the first would always be first because the formative and social aspects provided useful introductory questions. The second tactic was soon abandoned when it became clear that it alarmed and constrained the interviewees.

Table 1:

Formative:	Social aspect:
1. What system are you using currently? 2. How the system was introduced to you? 3. How the system helps you to complete your work? 4. How long you have been using the system? 5. Any difficulties in using the system?	1. How your superior treats you with regards to your work? 2. How about your relationship with other colleagues from other departments?

Table 1

The first tactic, using the formative and social aspects had as its main objective to open up a discussion for users to feel comfortable in sharing their experiences. Formative was used because it relates to interviewee's task in using the system and to the system itself whereas social relates to roles and relationship between staff in the organisation studied. *Table 1* shows the type of questions asked regarding each aspect. Most questions focused on job tasks because job task is the main aim and relates to system usage. Not all questions were asked of each interviewee, but they provided general guideline to the researcher to initiate the interview session.

The second tactic was to show a list of fifteen aspects to the interviewee. The researcher received negative response from the first interviewee who looked stunned and asked whether she needed to think of issues related to all the aspects. The researcher explained the aspects but the interviewee still refused to cooperate. Attempts to show the list of aspects during the interview was later abandoned.

In the third tactic the researcher did not approach the question based on aspects but based these on what had previously been shared by interviewees. As Ramachandran (2011) states, a general rule in discussion seems to be that "if you ask a good question, the answer should lead to additional interesting questions". This leads to a situation where the researcher will pose further questions based on answers given earlier. As a result, this will further reveal other meaningful issues that the interviewees may not realise. This tactic also provides

opportunities for extensive exposure to the mandatory IS use life-world (Nandhakumar & Jones, 1997). The researcher allowed the interviewee to voice out any new ideas, so the direction of discussion would sometimes change to track down a new issue given by the interviewee.

The first part of the question as shown in Example 2 below is related to the interviewee's job tasks where he explained how his work started and what the outcome was. Once he prompted the word `public', the researcher asked a question related to the public issue. At the end of the session, the researcher asked the interviewees if they had any other issues they want to discuss about system usage. This is to ensure that interviewees have nothing left in their mind that they want to share.

Example 2 – Question: Can you share with me your responsibilities related to the system?

Answer: (M5g) *My work will start once clerk has done her part. With AVIS the work for Clerk becomes lesser but for me as technician there is more work to be done. What clerk needs to do is they will register the case through AVIS. Once it has been registered then I can proceed on my part to key-in all figures for calculation of tax assessment. Once AVIS calculates the tax assessment figures, I'll forward to superior for approval before sending it to public for tax payment.*

Question: How can the public make payment?

Answer: (M5h) *If the public wants to make any payment, the counter service staff will login into AVIS to reconcile the figures. If they find the figures tally with the payment the counter service staff will process the payment.*
(M5i) As you can see, AVIS is used by valuation department staff and also counter service staff. IT department has to limit the number of staff allowed to use AVIS at one time. Due to this, in some situation AVIS gets stuck and hangs while I'm still doing my work. At that point, I just have to wait since I cannot do anything. We have been facing this issue since 2007 and management needs more budget for IT investment so such problem does not occur again. Due to this we have to accept as what it is.

The fourth tactic was to ask questions based on any aspects that came to mind as significant. The knowledge of aspects was kept at the back of researcher's mind rather than by showing the list to interviewees. During the fourth tactic, as

Example 3 shows, the earlier conversation concerns issues of the interviewee doing a process of the application form. Then she mentioned, “do other task instructed by my boss”. This prompted the juridical aspect, to help in understanding whether the interviewee has been fairly treated by her boss giving tasks that had not been specifically mentioned in the job description. The explanation given shows that she has no problems doing other additional tasks given by her boss.

Example 3 – Question: In one day roughly how many forms did you receive?

Answer: (M6f) *Not consistent, so far I received up to 20 new forms per day plus forms from previous applicants. Whatever I received in the morning I must make sure to complete it on the same day. However if I received it after 16:00 hours, I can complete it by tomorrow morning the latest. I also do other tasks instructed by my boss like preparing letter.*
(Posted a question based on juridical aspect)

Question: In the licence department who else other than you does the same things especially keying-in information into the system?

Answer: (M6g) *No one else. I’m the only one who will process the application for new license. Other colleagues will help if I’m on leave or on holiday. As I mentioned earlier not many forms to process so I can do it on my own. Sometimes it’s only 10 forms. So I think we don’t need more staff to do what I do currently. Normally I will walk to the counter and request the form so that my work will not be put on hold. If I wait for the counter service staff to pass it to me, they will normally do it around 10:00 hours or at 16:00 hours. For me it is too late to process the forms on the same day. No days without the forms. This will also keep me moving and I will not get bored, just sit at one place. During this time I can also chat with some of my colleagues just to say hi. You just imagine if I sit at my place from morning until the end of office hour surely I will feel bored and sleepy too.*

4.2 *Approach during analysis*
Analysis is the final stage to hear the meaning of, understand and organise what has been said by interviewees. Analysis starts with the interpretation process of what interviewees said (Robson & Foster, 1989, p. 85). It is crucial to understand the meanings shared by interviewees, treating each interview as a unique

situation, the researcher using their own intuition in responding to interviewee's questions. In some cases, interviewees might have shared their `painful experiences'. Analysis can be exciting because of "continuing sense of discovery but can also be intimidating due to sheer amount of interview data that has to be understood" (Rubin & Rubin, 2004). The amount of data generated by qualitative methods is huge and the process of making sense out of pages related to interviews can be "overwhelming" (Patton, 1990).
Since this study is qualitative it dealt more with words than figures. Analysis consisted of two parts. Tesch (1990) was used as a guidance to develop an organising system for unstructured qualitative data from interview transcriptions and generate a list of issues under themes. These were then further analysed with reference to Dooyeweerd's suite of fifteen aspects where the aspects helped find the DTE issues, especially those that were hidden.
In structuring the bulk of qualitative data Tesch (1990) was also used. He named the process of segmenting and categorizing data 'de-contextualization' and 're-contextualization' (p. 115). All unstructured data of interviews that gave the same meaning were brought together to generate several themes of groups. The data was examined to understand what issues were discussed by interviewees and labeled (Patton, 1990). The following general steps were taken. Data transcriptions were read carefully to get the whole idea that had been shared by the interviewees and at the same time stating their main issues or topics.

* Once a set of interviews was finished, state all topics identified and continue with others.
* Any new topics revealed, update the list.
* Compiled groups from the sentences or passages that explain the same topic or issues.
* Formed groups.

Words uttered by interviewees make up the sentences to present a story. However, what has been said through words does not necessarily explain the real situation nor the reason why it is said. Words or sentences have `multiple meanings' (Miles & Huberman, 1994). One type of multiple meaning was investigated by Austin as `Illocutionary act': "uttering a sentence with a certain force." Example: "I am going to do it" can be (can have the force of) a promise, a prediction, a threat, a warning and a statement of intention" (Searle, 1968). Therefore, analysis was not based only on the sentences but also on the need to

understand the `multiple meaning' of what is said by the system users and to uncover the semantic `behind' the sentences explained by individuals.

This was achieved by using Dooyeweerd's aspects. Each aspect is important in human activity in general, and thus in IS use, whether voluntary or mandatory. IS usage is seen by Dooyeweerd as human functioning in a number of aspects, each of which is a distinct sphere of meaning. These spheres of meaning make possible both the explicit meaning of the sentence and also its various illocutionary meanings. Hence, multiple meanings can be discovered and uncovered by reference to Dooyeweerd's suite of aspects.

When reading the passages, the researcher looked for words or sentences that are meaningful to interviewees and at the same time incorporated aspects starting from Biotic up to Pistic (see Basden & Ahmad 2001, this volume, for the aspects). The earlier aspects – Quantitative, Spatial, Kinematic and Physical aspect – were not analysed since they are related to pre-human functioning, where no feeling is involved. The main question asked when analysing the passages was: Which aspect or aspects are meaningful for this particular issue? This was asked again on passages. The aspects were considered one by one.

During the analysis process, the researcher's imagination of the situation contributed to have a feel for what is happening. The imagination helps in two ways: By imagination, aspects help to find other issues and by imagination any prior experience the researcher might have helps to see how new aspects might be relevant. The first author had earlier been employed in situations of mandatory IS use similar to those being researched, and so could feel as though in the shoes of interviewee. She would ask a question like: If I were the interviewee, why would such issue be meaningful? And, in what way it is meaningful? Using the imagination, the researcher's prior experience helped to understand the interviewee's concerns on system usage issue.

In general, the kernel meaning of each aspect may be grasped with our intuition, rather than by theoretical thought (Basden, 2008): this recommends the aspects as a tool for use in analysis because both researcher and interviewee can intuitively understand them. This way, aspects helped to understand and reveal DTE issues in IS use in both interview and analysis. Some examples of findings follow.

5. *Findings*

Table 1:

Formative:	Social aspect:
1. What system are you using currently? 2. How the system was introduced to you? 3. How the system helps you to complete your work? 4. How long you have been using the system? 5. Any difficulties in using the system?	1. How your superior treats you with regards to your work? 2. How about your relationship with other colleagues from other departments?

Table 2(a): Groups and Issues

5.1 *Identification of issues and groups from standard qualitative analysis*
Table 2 shows the list of groups and issues identified from the interview transcription based on the general guideline of organising qualitative data by Tesch (1990). Table 2 not only includes IS use issues but also other related matters that might influence the way users used the system. If the researcher focuses on IS use matters only, there are circumstances in which other meaningful issues might have been overlooked, particularly issues that might be related to the way users use the IS. Examples include `dealing with public matters' or `family commitment'. Public issue for example, does affect the user's flow of work, sometimes. As the interviewee explained:

2	System Use Related	• Experience using the system • Password • Information availability • Simple system to use • System performance when many users login at the same time • The amount of information to key-in into system • Bored with the system features • Using separate system for individual business functions • Exploring the system • Using another longer language that is easy to understand • System failed to capture transaction done • First time using the system • Guidance and help from seniors to use the system • Staff cooperation • Difficulties when using the system
3	New System Implementation	• Unsuccessful data migration from old to the new system • Feedback from users • New system running parallel with the current system • Users not happy with the new system • Vendor's assistance
4	Working Environment Factors	• Performance assessment • Relationship between staff • Replacement of staff on holiday • Work pressure

Table 2 (b): Groups and Issues

"I cannot really concentrate on my work because the public stand in-front of me. Sometimes to finish one file it takes up the whole morning lasting until lunch. Whatever the situation is we must entertain them. We did highlight to

management to have one staff for license counter but the management did not approve it" (M6ak).

Dooyeweerd's aspects were not used when groups were formed. This is because the meaningfulness of the groups listed in the table is life-world meaning that are built up from experience and other functioning in life.

5.2 *Limitation in result form standard qualitative analysis*
Some of the issues in Table 2 are already DTE issues, but many are not. As explained in the background of the study, extant qualitative analysis methods have limitations in revealing the hidden and multiple meanings of what has been said by interviewees. To overcome the limitation it was suggested that Dooyeweerd's aspects be incorporated since human everyday activities are functioning in many aspects. Basden and Ahmad (2011) have explained the reason for using Dooyeweerd's aspects to understand the meaningful issues in everyday experience of system users and give some justification for doing so.

		• Flexible working hours • Morning briefing • Promotion to another position • Meeting to solve issues • Job rotation • Facilities to complete task • Office layout • Teamwork's attitude
5	Seniors and Top management Attitude Influence Staff's Work	• Colleagues not being considerate • Supportive superior • Supervisor's trust • Checking other staff's work • Top management changes every two years
6	Individual's Attitude Towards Work	• Working more hours • Own creativity to expedite work flow • Prioritise work that is important • Split work and home matters • Doing routine work • Enjoy doing current work • Hard to make changes on work being practiced
7	Public Matters Influence Staff's Work Flow	• Dealing with other public matters • Service counter facilities to entertain public matters • Easy public access to office area • Handle public's anger

Table 2(c): Groups and Issues

Human life is seen as a complex, integrated functioning that can only be adequately explained by reference to all the aspects (Basden, 2002). This echoes Ozer and Yilmaz (2011) who state "to derive benefits from IT completely, it has to be discovered in all aspects".
Dooyeweerd's aspects are preferred to those of others for several reasons (Basden, 2001). Firstly, they have wider coverage since most aspects identified in

the literature are a subset of the Dooyeweerd's aspects, so Dooyeweerd helps to look for issues that have been overlooked. Secondly, Dooyeweerd's set of aspects has been subjected to philosophical and historical scrutiny. Thirdly, Dooyeweerd himself spent a life's work thinking about the aspects. However, Dooyeweerd (1955, Vol. II, page 556) made clear that any set of aspects, including his own, cannot be considered a final truth because separating them out depends on theoretical analysis; his set is only his best guess at the diversity of meaning.

Once groups had been compiled, Dooyeweerd's aspects were incorporated to understand intuitively the everyday life activities of system users and to use aspects to discover and uncover deeper meaning on everyday issues. All groups were analysed by using the aspects. None of the groups were ignored because Dooyeweerd's aspects help to reveal other issues in everyday life activities that interviewees themselves did not realise were meaningful that may be related to IS use. For example, `Family Commitment' is not directly linked to system usage but if anything happens to the family, the system users are unable to focus on their work. Use of Dooyeweerd's aspects generated the different perspective or angle to see how users deal with an issue like Family Commitment.

The next section will explain what had been found and how to employ Dooyeweerd's aspects to understand multiple meanings and reveal hidden DTE issues.

5.3 *Dooyeweerd's aspects to understand and reveal DTE issues*

It was found that aspects relate to issues generated by qualitative analysis in two main ways, each of which provides a different way of revealing DTE issues.

5.3.1 *Aspect direct from issue/s*

In some issues only one aspect was identified as being meaningful, and this aspect directly showed what is meaningful to the users. Such issues are already DTE, and no further analysis was done. For example:

Code	Issues	Passages	Aspect/s

SU7	Bored with system features	**(M9a3)** *A bit bored because of the interface.***(M12q)** *LoGInS is very old system, sometimes I get bored. As you can see it is not very colourful. LoGInS use white background and black colour for the wordings.*	**(SU7a) Aesthetic –** unhappy with the system feature and feeling bored (direct form issue)

Because users felt bored with the system features it gave the impression that interviewees felt unhappy with what they see and wished that the system could have better features instead. Boredom directly affects quality of MISU. The aspect that helps to understand the above situation is the 'aesthetic' since its kernel is style, enjoyment, interestingness and harmony.

Identifying which aspect makes the issue meaningful to users has two benefits. One is that it explains more clearly what it is about the issue that is meaningful to users. The other is that reference to its main aspect can help raise questions that can deepen further exploration. For example, if we were to ask how boredom with system features might be overcome, and we did not make reference to the aesthetic aspect, we would be tempted to add flashy colours (since colour is mentioned), but it is likely this would not solve the problem except for a few days. However, if we recognise that aesthetics is not just of user interfaces but of human living, and it concerns not just style but also with harmony and interest and enjoyment, then we might pose the question of whether use of the IS is harmonious with the rest of the users' lives or not, and whether there is enjoyment or interest in the whole use, and see whether this is the cause of apparent boredom. Thus, though the issues found by qualitative analysis sometimes can be considered as DTE issues, aspects can deepen our understanding of them.

5.3.2 *Aspects discover DTE issues from passages*

The second way aspects are used is to understand the passage based on words clearly mentioned by interviewees. The word(s) were identified directly from passages.

Code	Issues	Passages	Aspect/s

SU2	Password	**(M2g)** *I just need to use command to extract the information. What I* ***must remember*** *is my password and press 'ENTER' few times and* ***that's it****.***(M2g)** *I have to logout once I'm not using the system. This is important to* ***protect*** *our password. If other staffs use our password, we might be caught. But sometimes I forget, too.* **(M11h)** *Password also bring* ***difficulties*** *to me, since we are* ***using different system, surely we need different password****. If too many passwords, we will forget. Even if we write somewhere at the end we misplace.*	**(SU2a) Lingual** – password to login into system**(SU2b)Juridical –** users are responsible for protecting the password from wrong doing by unauthorised users because if not users themselves will be caught **(SU2c) Analytical** – users need to think and choose which password is meant for information access **(SUd) Sensory** – users need to remember the password since they are using more than one system

'Password', as shown in the table above is one example of the issues to users. Its most obvious aspect is the lingual, since users can only login into the system by using symbols either alphabets or numbers. Though perhaps useful to academic and technical literature, `password', has limitations when considering DTE issues because this does not explain why it is a concern to users. The issue of password

carries hidden connotations and might have multiple meanings of why the password is important.

To understand this further, the passages were analysed to understand the multiple meanings of issues, which are often hidden. Each sentence about password mentions one or more things that are of concern, and highlighting the aspect that makes that concern meaningful can bring it to light as a DTE issue. The juridical aspect brings to light the situation where users need to make sure the password is protected from use by other users. The analytical aspect brings to light the user's need to choose and think which password is related to which particular system. The sensory aspect brings to light the mental activity of remembering or forgetting. The password functions in each of these aspects, each of which causes a different concern for users.
It is the user's concern that makes an issue like 'password' important, and the aspects show the ways in which the issue can be Down-To-Earth (DTE) in mandatory IS use. The above analysis has shown that what is usually assumed to be a single issue password, is transformed into at least three DTE issues, each related to the meaning and normativity of its aspect. The analysis also shows that from the DTE point of view password is no longer a single issue. In such ways many of the issues in Table 2 were found to have multiple aspects that made them meaningful to users, each relating to something the users said. Once we understood the issues in depth, aspectual analysis helped to reveal hidden issues that are of concern to users.

6. *Discussion and conclusions*

6.1 *Summary*

This paper has discussed a new way of investigating mandatory information system use (MISU). It involves how to uncover and understand issues that are important in the everyday working life of system users using Dooyeweerd's aspects: 'down-to-earth' (DTE) issues as introduced by Basden & Ahmad (2011). Sometimes DTE issues relate to formal tasks, sometimes to informal tasks, and sometimes to unofficial ways of using the IS that were not foreseen by system designers or implementers.
Largely unstructured interviews were conducted with system users. Dooyeweerd's suite of fifteen aspects was used, mainly during analysis, to understand and reveal DTE issues. For each utterance of each interviewee, the main aspects (employed as categories of distinct ways in which things may be

meaningful) were identified that make the utterance meaningful to, and in the context of, the interviewee.

Standard interpretive and qualitative analysis techniques can often miss them, but augmenting them with Dooyeweerd's aspects helps reveal those that are hidden and provide deeper understanding of those that are not. DTE issues are not always easy to discover, partly because they are not anticipated by the theories that usually guide the researcher (theoretical reason), and partly because many are hidden behind what interviewees say (practical reason). Though some interpretive and qualitative analysis techniques, such as Grounded Theory (Glaser & Strauss, 1967), can often avoid the first problem by bypassing the theories, they still face the second.

This research contained both types of cases. A number of issues, such as `bored with system features', are DTE issues discovered by qualitative methods, but by identifying the main aspect that makes them meaningful, our understanding of them can be deepened and widened (for example, beyond boring user interfaces, to boredom in the life of the users). Other issues identified by qualitative methods, such as password, are shown by aspectual analysis to hide a set of different concerns that are meaningful to users. Such hidden issues are revealed by identifying aspects that make what users say meaningful. It is the set of concerns that make the password an issue to users, rather than the password as such. This research thus demonstrates the facility of Dooyeweerd's aspects to reveal DTE issues, so it will be used in a fuller study of MISU.

6.2 *Limitations of this research*

This research has demonstrated a method by which DTE issues may be revealed, but it exhibits limitations. One is that all the interviews were carried out in a single organisation. It is possible, therefore, that it was the organisational context that made Dooyeweerd's aspects useful, and that they would be less useful in other organisations. This is unlikely because there was nothing in the Dooyeweerdian analysis that depended on, or presupposed, a particular organisational context. IS use in other organisations will be analysed in the full study.

Another limitation is that only one qualitative analysis method has been used, that of Tesch (1990) and that this had specific limitations that happened to be overcome by Dooyeweerd's aspects. As Creswell (2007) states, "Unquestionably, there is no single way to analyze qualitative data. It is an eclectic process in which you try to make sense of the information. Thus the approaches to data

analysis by qualitative writers will vary considerably". It is possible that other methods, such as Grounded Theory (Glaser & Strauss, 1967), might reveal DTE issues without needing help from Dooyeweerd's aspects. Whether this is so, remains to be explored, but initial indications suggest otherwise. Both Grounded Theory coding and Klein & Myers' (1999) interpretation already assume that certain things are meaningful to the researcher. For example Lamb & Kling (2003) report use of Grounded Theory methods to reconceptualise the user as a social actor, and emerge with four main dimensions: affiliation, environment, interaction, and identity. A closer look, however, reveals that these four concepts were already identified in their discussion of extant theoretical discourse on IS use. Such dimensions are, according to Dooyeweerd, rooted in aspects as spheres of meaning, whether they are recognised or not, and usually omit several important aspects. So it is likely that Dooyeweerd's aspects can enrich any qualitative analysis technique.

6.3 *Strengths and contributions of this research*

Whereas most qualitative analysis techniques try to reveal what issues are important, Dooyeweerd's aspects focus on why they are important, and on their normative content (good / bad). As Habermas (1987) and others have pointed out, it is meaning and normativity that are important in the shared background knowledge of people (their life world), so Dooyeweerd's aspects are uniquely attuned to the everyday experience of people. That Dooyeweerd's suite of aspects cover, as far as is known, all ways of meaning and modes of being and functioning that are known gives it a flexibility that Cote et al. (1993) believe important to doing qualitative analysis.

Dooyeweerd's approach inherently recognises the illocutionary meaning that is hidden underneath or behind what people express in their sentences, because he sees the sentences as human functioning in the lingual aspect rather than merely as sequences of symbols. Dooyeweerd's suite of aspects helps us reveal this illocutionary meaning because the illocutionary meaning of sentences is what they mean within the (multi-aspectual) human activity in relation to which the sentences are uttered. Interviewees (IS users in this case) are seen simultaneously as individuals and also as social actors, as Lamb & Kling (2003) recommend.

"A chronic problem of qualitative research," write Miles and Huberman (1994, p. 56), "is that it is done chiefly with words, not with numbers. Words are fatter than

numbers and usually have multiple meanings". Since, to Dooyeweerd, all things exhibit all aspects, multiple meanings are to be expected rather than seen as a troublesome exception. Dooyeweerd is thus commensurate with Klein & Myers' (1999) principles of interpretive research; indeed these principles might benefit from Dooyeweerd more generally.

An important issue therein is the relationship between the researcher and the researched. To Dooyeweerd, both function as subjects to the same aspectual laws, the kernel meanings of which may be grasped by our intuition, though they cannot be grasped by theoretical thought. Aspectual meaning transcends cultures, so an intuitive grasp thereof can facilitate analysis across cultures. So Dooyeweerd's aspects might offer a way towards some mutual understanding not only between the researcher and the researched, but also across different cultures. It may be noted that the authors of this paper come from Malaysia and the United Kingdom.

It might also be because of the intuitiveness of aspectual meanings that this approach seems able to reveal in a one-hour interview the kinds of things that it took (Wenger, 1999) a longitudinal ethnographic study to reveal. This approach might therefore offer efficiency and speed of analysis without sacrificing sensitivity to what is truly meaningful to the interviewees.

6.4 *Conclusion*

This paper can be interesting to both academician and practitioner. To the academician it, establishes a new approach to understanding, thinking about and discussing IS use: 'down-to-earth' issues. To the practitioner, it provides, in draft form, a method of analysing situations of IS use to reveal what is important and meaningful to the users rather than to, researchers, IS developers or senior managers for example, in the situation of use.

It might, however, be extendible in two ways. One is to ask whether Dooyeweerd's aspects can be used other than with qualitative analysis. In particular, could Dooyeweerd's aspects be used on their own to identify DTE issues? Winfield's 'Multi-aspectual Knowledge Elicitation' method used Dooyeweerd's aspects on their own to surface many meaningful concepts (Winfield, 2000; Winfield & Basden, 2006; Winfield, et al., 1996). However, to employ Dooyeweerd's aspects with existing methods of qualitative analysis has advantages of capitalising on widely-known skills and also of being more understandable.

Another extension is to apply it not to current IS use, but to future or imagined IS use, such as in design. To employ Dooyeweerd's aspects in design one would ask in what ways each aspect might manifest itself in the designed situation of IS use, perhaps with reference to aspectual studies of DTE issues in existing use. In either case, this research offers a way of finding out what is truly important in IS use, rather than trying to fit IS use into the mould of existing theory.

Appendix 1 – *The information systems studied*

There are various systems used and it is not an integrated type of system. The systems are known as Local Government Information System (LoGInS), Finance Information System (FINIS) and, Assessment and Valuation IS (AVIS). However, since the case study looks at the system that captures all business process, even though it is not integrated, it is still important and must be used by users who work in organisation. During the interview period, the organisation was in a process of implementing a new system known as e-PBT that will replace LoGInS. E-PBT is created by vendor that has been selected by the Federal Government and had to be used by all local authorities by end of 2010 (the interviews took place a year earlier).

AVIS is designed specifically for tax assessment calculation and valuation of assets until the issuance of bills charged to the related resident since 2008. FINIS is meant for accounting related until reporting the financial performance. LoGInS is a system that captured most of the business processes with other information not stored in AVIS and FINIS. LoGInS is the oldest system used, followed by FINIS and the latest system introduced is AVIS. AVIS is the only system that was designed by organisation's personnel, who are well versed with the whole process of tax assessment. FINIS and LoGInS were customised based on user's requirements.

Since the system is not integrated, all information needed was transferred manually, from AVIS to LoGInS then to FINIS. This causes difficulty. During the transmission of data there were cases where some data have been left out and figures were not the same as given by the source system. This matter currently is taken into consideration by management.

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IIDE Proceedings 2011 ~ Vol. 2 ~ Investigating The Effects Of IS Development Ethical Issues On Information System Units From Dooyeweerd's Suite Of Aspects Perspectives

Abstract

Discussion of the likely effects of ethical issues of Information System Development (IS Development – ISD) on information system units is sparse and does not present a coherent picture. In this regard, throughout this theoretical study, it is tried to apply Dooyeweerd's suite of aspects to ethical issues of ISD in order to explore and analyse their consequences of functioning regarding good and bad of applicable aspects. Conducting this analysis is describing that ethical functioning will result in diverse types of good which are distinguishable by referencing each to specific Dooyeweerd's aspects. This functioning also implicates a given situation in which sacrifices such as effort, pleasure or etc is involved as thus extra good will be created. In this context, the distinction between the conception of bringing (extra) good by ethical functioning and merely preventing bad by juridical functioning is clarified throughout applying Dooyeweerdian aspectual analysis.

Keywords:
Ethical Issues, Ethical Functioning, Dooyeweerd's Aspects, IS Development (ISD), Extra Good

1. *Introduction*

Ethical principles have been always assumed as part of everyday life and problems and issues emerged by ignoring them have been also discussed by different scholars (Stahl, 2007, 2008). Ethical issues can be studied in relation to professional life as well (Gotterbarn, 1992, Stahl, 2008). This includes ethical principles in information system (e.g. McDonald, 2007) and the information system development areas (Rogerson, et al, 2000; Cohen and Cornwell, 1989; Wu, et al., 2001; Warren, 2006). Gotterbarn (1992) debated that professionals must be aware of ethical issues in their profession in order to restrict the possibility of their occurrence. Charlesworth and Swery (2002) argued that IS professionals should be aware of ethical issues that both generally and specifically can affect their works, organizations and related stakeholders.

However, as studies show and also explicitly highlighted by some scholars (e.g. studying difference between ethical and legal issues by Pollack and Hartzel, 2006), discussions of consequences of ethical issues suffers from blending with other subject areas such as moral issues, legal issues, social issues and etc. Besides, different studies in this field (e.g. McDonald, 2007) and ethical issues frameworks that formulated by disparate institutes (e.g. ACM Code of Ethics) demonstrate the importance of discussing consequences of ethical issues in ISD.

However, the treatment of ethical issues lacks an overall coherence, and there is still need to discuss the effects of ignoring and breaking ethical issues in ISD. Understanding those consequences can help IS developers and information system units be aware of possible problems they might face in information system projects. To discover those consequences, an understanding of ethical functioning that embraces the wide diversity of issues and their consequences is required. For this aim, we have first studied and employed several existed ethical issues frameworks outlined by scholars or (related) institutes. And in the second step, those ethical issues are analyzed by the means of Dooyeweerd's suite of aspects which consists of fifteen irreducible yet related aspects. The meanings of aspects can indicate the main properties and behaviours of ethical issues and the laws of aspects can address their way of functioning and highlight good and bad consequences.

It is worthy to point out that ethical issues are not limited to selected ethical issues discussed in this study. That is, the aim of this paper is not extending or modifying ethical issues but authors intend to highlight the consequences of breaking or ignoring ethical issues by selecting some of existed ones.
We expect that this brief theoretical study, can highlight the role of ethical issues in ISD and draw involved IS developers' attention to include ethical issues in Information System (IS) projects in adjustment with other important factors.

2. *Ethical Issues of ISD*

2.1 *Review of ethical issues*

Following Mason's (1986) debate about ethical issues of information era – PAPA: Privacy, Accuracy, Property, and Accessibility – many researchers constructed their studies based on this structure either explicitly (e.g. Pollack and Hartzel, 2006) or implicitly (e.g. Rogerson et al., 2000). Over the years more studies have proposed new dimensions to PAPA (Thomson and Schmoldt, 2001). Other frameworks were developed, such as one based on obligations (Johnson, 1985 stated by Oz, 1992) and some institutes such as Association for Computing Machinery (ACM), the British Computer Society (BCS), and The Australian Computer Society (ACS) (Thomson and Schmoldt, 2001). Table 1 summarises some of these.

Framework		**Source**
PAPA	Privacy, Accuracy, Property, Accessibility	Mason, 1986
Extended PAPA	PAPA+ Quality of Life, and the Use of Knowledge in Organizations	Forester and Morrison, 1994 and Bella, 1992

Obligations	Obligations to society, employer, clients, and colleagues and professional and organizations	Johnson, 1985
ACM Code of Ethics	Contribute to society and human well-being, …	http://www.acm.org/about/code-of-ethics
BCS Code of Conduct	The Public Interest, Authority, …	http://www.bcs.org/server.php?show=nav.6030
ACS Code of Ethics	Priorities, Honesty, …	http://www.acs.org.au/index.cfm?action=show&conID=coe

Table 1. Framework of Professional Ethical Issues

Some of these ethical issues are common among all frameworks, some have been stated in different wordings but their descriptions and characteristics are similar, and some are specific to certain frameworks.

In the PAPA framework, the emphases are on protecting dignities of individuals and avoiding of indignities of deprivation of information literacy (Mason, 1986). In an extension, quality of life is focused on job satisfaction, health, safety and emotional concerns, and overall satisfaction. (Forester and Morrison, 1994 stated by Thomson and Schmoldt, 2001)

In the obligations framework, IS professionals through their interactions with society, employers, clients, colleagues, and organization need to be responsible for updating their own knowledge and that of involved stakeholders, applying practical knowledge into their work, and being involved in improvements. Important characteristics include respect, dignity, being objective, being protective and supportive, confidentiality and trust, intelligibility of language, avoiding conflicts of interest, and lawfulness. They should not abuse their own expertise and experience. (Johnson, 1985 stated by Oz, 1992)

The BCS professional code of conduct and ACM code of ethics have quite similar focuses in which the professional must be aware of public health, safety and environment, legitimate rights of third parties (colleagues, organization, employer, public, and even competitors). Important characteristics include: lawfulness, dignity and respect, violations because of discrimination on inappropriate grounds (race, colour, ethnic origin, gender, sexual orientation, age and disability), resource accessibility, avoiding conflicts of interest, being supportive, and involvement in improvements, harmony and integrity with others, updating and using related knowledge, evaluation and self-assessment. There must be no abusing of lack of knowledge and experience in others.

The ACS Code of Ethics has also investigated a variety of ethical issues for IS professionals in relation to clients, employers, and colleagues. IS professionals are responsible for priorities they might set for others' interests and needs in relation to their own, providing enough information to stakeholders for involving them, awareness of stakeholders' needs and interests, honesty in justification and evaluation of stakeholders, presenting and using real knowledge and skill they have, social implications which protect health, feelings and safety of work, privacy, avoiding unfair treatment of others, ensuring overall satisfaction and quality of life, professional development and updating knowledge and skill of involved stakeholders and of themselves. They should look into the way professionals are interacting with each other and their clients to respect ideas, avoid abuse of others' works and reputation, and avoid direct or indirect dishonesty and fraud by cooperating with hustlers.

2.2 *Consequences of ethical issues*

Central to the above discussions of ISD ethics are norms of which ISD professionals should be aware and be guided by (Mason 1986; Forester and Morrison, 1994; Bella, 1992; BCS; ACM; ACS), responsibilities they should take on (Johnson, 1985; BCS; ACS; ACM) and behaviour of professionals (BCS; ACS; ACM). But there has been little discussion of consequences of breaking (or indeed upholding) ethical principles.

There have been various theoretical (e.g. Thomson and Schmoldt, 2001; Chapman, 2006) and practical (e.g. Wood-Harper, et al., 1996; Rogerson, et al., 2000; Davison and Loch, 2002; McDonald, 2007) studies during last decades on how and whether ethical issues can affect information system development process. From most of these investigations we can conclude that regardless of the structure information system units take for their profession, the application of

ethical principles is a must for them. Gotterbarn (2002) argued that information system developers need to enlarge the risk analysis boundary to include ethical issues as part of their risk assessment, because his cases showed that ignoring ethical issues (besides social and political issues) resulted in impractical software applications and the need for IS developers to continually modify their products, which problems can drive organizations out of business. In older studies like Oz (1992) and Wood-Harper et al. (1996), there have been debates that ethical considerations can uphold information system units and professions in terms of good reputation and respect.

However, in most of these studies (including those in section 2.1), there has not been adequate debate about the consequences of ethical issues. First, discussion of consequences has tended to be divorced from discussion of norms, behaviour and responsibility, with the attendant danger of sliding into a purely utilitarian view of ethics. Second, limited types of consequences have been discussed, and there is no clear means of widening the diversity of issues. For example, in the current volume, Krishnan Harihara & Basden (2011), along with their (2010, 2009), show how idolatry of technology can harm e-government projects, bringing harmful effects on society when it is implemented. The idolatry is by politicians, senior managers but also by IS developers, so the issue is relevant to ISD; should this be brought into the debate on ethics of ISD and, if so, how? Third, there seems to be two discourses in ISD ethics, one about evils to be prevented (e.g. Gotterbarn, 2002), the other about good that ethical behaviour can bring (e.g. Wood-Harper et al. 1995), with no clear link between them. Related to this, ethical issues are confused with moral (Stahl, 2007) or legal (Pollack and Hartzel, 2006) or social (Laudon & Laudon 2009) issues.

This paper offers an approach that might address these shortcomings. It is based on the philosophy of Dooyeweerd (1955) and carries out a systematic study in an attempt to demonstrate how all these issues may be set within a coherent framework that provides a basis for considering consequences of ethical issues in ISD.

3. *Introducing Dooyeweerd's aspects*

The Dutch philosopher (1894-1977) Herman Dooyeweerd delineated fifteen different aspects, which can be understood as "spheres of meaning" and "spheres of law". In the former one, the emphasis is on how things can be meaningful and this meaning is expressed in the existence, properties and rationality of things

and in the latter one, the focus is on goodness, badness and functionality of things. Table 2 shows Dooyeweerd's aspects, what we understand of their meaning and some typical examples of good and bad functioning and repercussions. For more on Dooyeweerd's aspects, see chapter III of Basden (2008).

Aspect	**(Meaning)**	**Example Functioning (Good / bad)**	**Example Repercussions (Benefit / Detriment)**
MATHEMATICAL ASPECTS			
Quantitative aspect	(Discrete amount)	Being-amount	Numeric order
Spatial aspect	(Continuous extension)	Spreading	Simultaneity
Kinematic aspect	(Flowing movement)	Moving	Dynamism
PRE-HUMAN ASPECTS			
Physical aspect	(Fields, Energy, mass)	Causality	Persistence
Biotic/organic aspect	(Life, organism)	Life functions	Health, Growth
Sensitive/psychic	(Sensing, feeling, emotion)	Sensitivity	Interaction with world
HUMAN ASPECTS			
Analytical aspect	(Distinction, concepts, Abstraction, logic)	Distinction / Blurring	Confusion / Clarity
Formative aspect	(Deliberate shaping, Technology, skill, history)	Planning, constructing / Laziness	Achievement, Structure / Failure, Mess

Lingual aspect	(Symbolic signification)	Truth-saying / Deceit	Understanding / Misunderstanding
SOCIAL ASPECTS			
Social aspect	(Relationships, roles)	Respect, Friendship / Hostility	Organisations / Enmity
Economic aspect	(Frugality, resources; Management)	Frugality / Profligacy	Prosperity / destitution
Aesthetic aspect	(Harmony, delight)	Orchestration / Frenzy	Beauty, Fun, Interest / Grotesqueness, Boredom
SOCIETAL ASPECTS			
Juridical aspect	('Due', appropriateness; Rights, responsibilities)	Responsibility, appropriateness / Oppression, inappropriateness	Justice / Injustice
Ethical aspect	(Attitude, Self-giving love)	Generosity, humility / Selfishness, Greed	Goodwill / Defensiveness, More greed
Pistic/Faith aspect	(Faith, commitment, belief; Vision of who we are)	Belief, Loyalty / Disloyalty, Idolatry	Trust, Dignity / Distrust, Decline

Table 2. Dooyeweerd's Aspects: Meaning, Good and Bad

It is important to notice the difference between Dooyeweerd's technical concept of 'ethical' and the concept of 'ethical' as loosely discussed in the ISD literature. Dooyeweerd's concept is to do with attitude, of self-giving versus self-interest, while 'ethical' in ISD academic discourse covers both this and also what

Dooyeweerd calls juridical, namely ensuring rights and appropriateness; these are discussed below.

There are several reasons why Dooyeweerd's approach might enrich the discourse on ethics in ISD. Much of today's thinking on ethics has roots in such thinkers as Aristotle or Kant. Dooyeweerd claimed they had not been critical enough and he went deeper in attempting to understand the nature of the world and of human beings and activity in the world. He began from a very different root, that of Creation, Fall, Redemption (CFR) rather than the dualistic roots of Greek philosophy (Form v. Matter), Scholastic philosophy (Nature v. Grace) or Humanist philosophy (Nature v. Freedom), which always have, he argued, led to problems in understanding and discussing ethics. (He called these roots 'religious', but with a very specific meaning that should not be confused with creeds and religious systems.)

Starting from the CFR root led him to see created reality as having two sides, not only all that exists and occurs as concrete, ongoing actuality (what he called subject side or fact side) but also a law side (laws that pertain and enable all existence and occurrence). The law side is composed of 'laws' of the aspects. These however are not to be confused with social norms, nor with authoritarian demand or determinative causality, but take the form of promise; for example, a law-promise of the lingual aspect might be expressed as "If we abide by the syntax of the language we are using we will be better understood". In this way functioning always has consequences, these cannot be separated from each other, and both are inherently connected with norms (the good and bad defined by each aspect). Professional behaviour in ISD is seen as multi-aspectual human functioning (functioning in every aspect simultaneously and in a coherence that is located the human subject), so this can never (and so should never) be divorced from norms and consequences. Each aspect yields irreducibly distinct norms, types of functioning and types of consequence.

His approach to ethics may be founded in the idea that functioning in line with the laws of all aspects is, and leads to, good, while dysfunction in any aspect is, and leads to, bad. Because of being rooted in CFR, he held that no aspect contradicts another in this sense, so it is possible in principle to fulfil the norms of (and be, and bring, good in) every aspect. His thought can give a philosophical basis for questioning, for example, the common assumption that being ethical is inimical to economic viability (and vice versa). Not only so but good functioning in one can actually enhance functioning in another aspect; for example ethical

functioning in business and society can establish sustained viability and prosperity.

Dooyeweerd's notion of aspects arises from his notion of law and subject sides; his suite of fifteen aspects arose because of his roots in CFR, which allows for the possibility of a cohering diversity, in contrast to the dualistic presuppositions, which always act as motivation to reduce diversity to one or two basic principles. In particular this approach enabled him to distinguish the ethical from either the juridical or the pistic, which can bring clarity to discussion of 'ethics' in ISD, which tends to conflate them. Refer to Table 2. That the ethical cannot be reduced to the pistic implies that, though one's beliefs (credal or ideological or presupposed) might have some impact on what one holds to be right and wrong, ultimately the ethicality of self-giving and attitude cannot be absolutely determined by such beliefs; nor vice versa.

Distinguishing ethical from juridical aspect is particularly important for discussion of ISD 'ethics'. The juridical aspect is concerned with appropriateness and with human responsibility for maintaining what is appropriate. In particular, in the context of human functioning (such as in ISD), we are responsible for helping to ensure retribution, i.e. rewarding 'good' and punishing 'bad' either by individual action or by setting up social effective structures such as social norms or formal rules and regulations. All this achieves, however, is to prevent bad occurring. The ethical aspect, by contrast, introduces 'extra' good into temporal reality that cannot be explained by the ongoing operation of juridical consequence. As shown on left-hand side of Figure 1, functioning in the ethical aspect involves taking pains (even making sacrifices) to bring good to others that would not otherwise occur. Sacrifice might be of time, money, effort, convenience, pleasure, rights or anything else, and in this way 'extra' good-for-others enters the public sphere.

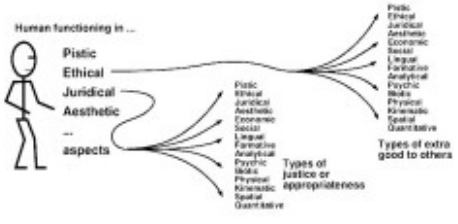

Figure 1. Dooyeweerdian understanding of ethical functioning

Figure 1. Dooyeweerdian

understanding of ethical functioning

Both juridical due and ethical extra good-for-others are of diverse kinds, which may be understood in terms of target aspects. Figure 1a shows this. This provides a conceptual framework with two benefits. First, the juridical due can be distinguished from ethical extra good, second the diversity of each can be explored systematically. Both juridical due and ethical self-giving are always directed toward some specific kind of normativity, each distinct kind of which is itself distinguished from others by reference to the aspects, as indicated in the middle of Figure 1.

Most discussion of 'ethics' in ISD is juridical in nature in that it is concerned with preventing bad and ensuring rights (for example, privacy, accuracy, property, accountability, honesty) rather than bringing about extra good, though a minority of the literature recognises this (such as good reputation (Wood-Harper et al. 1995) and 'quality of life'). Most discussion of responsibility, obligations, norms, professional behaviour centres on the juridical aspect. Discussion of consequences, however, is more open to the ethical aspect, because 'consequences' usually speaks of something positive, a good-for-others that would not otherwise have happened, rather than mere prevention of a negative.

This, then may be a way to integrating the two pools of discourse, without forcing either to be reduced to the other. This delineation of types of good-for-others for which we give of ourselves provides a rich starting-point for discussion of ethical functioning, enabling us to discuss the conditions necessary for each kind of good, the consequences of procuring each kind of good-for-others, and the consequences of not doing so, as in the right-hand side of Figure 1.
To test whether this approach has any potential, the next section considers most of the 'ethical' issues discussed in the ISD literature (whether juridical or ethical from a Dooyeweerdian sense) from the point of view of aspects. Since each aspect is reasonably well understood in general terms, we can bring this understanding to bear on discussions of ethical issues. Can an aspect (sometimes more than one) be readily assigned to express the main meaning and normativity of each, and can doing so reveal consequences that can be linked to norms, functioning and responsibility?

4. *Analyzing ethical issues using Dooyeweerd's aspects*
In section 3, Dooyeweerd's aspects were proposed as a way of thinking about

ethical issues. Besides, throughout section 2, different frameworks of professional ethical issues were demonstrated in table 1 and until the end of section; each of them was discussed in more detail. Thus, in order to analyze ethical issues, table 1 and its related information from section 2 is employed in this section. Meanwhile, before applying Dooyeweerdian thinking to them, where appropriate, similar ethical issues of different frameworks are combined, for example "applying practical knowledge into their work from" in obligation framework and "using relation knowledge" in BCS professional code of conduct and ACM code of ethics and "presenting and using real knowledge and skill they have" in ACS Code of Ethics are all combined under the name "Applying practical knowledge, skill and experience". After briefly describing them, we identify in which aspect they are most meaningful as good or bad, discuss the consequences of functioning in that aspect in relation to these issues, based on general understanding of aspectual repercussions such as discussed in Basden (2008). By doing this, a systematic consideration of ethical issues is demonstrated. Followings are arranged based on ordering of Dooyeweerdian grouping of aspects (available in table 2 in section 3 – Mathematical aspects are not discovered in analysis. The reason is provided in Discussion section).

A) *Pre-human aspects*

– Concerning mental and physical health and safety of individuals, organization and society: Mental and physical health and safety are psychic and biotic issues, and any detriment here makes people less able to work effectively. So IS developers should take pains to consider the wider biotic and psychic consequences of the applications they are developing (such as computer games).

– Quality of life, Overall satisfaction: IS developers by the means of their artefacts should contribute to improve public quality of life, and increase overall satisfaction. Though quality of life and satisfaction can cover most aspects, here we focus on its psychic aspect of emotion, since this affects the individual's interaction with the world.

– Being protective and supportive for colleagues, employers, and customers: Such support and help is both psychic and pistic in nature in that it is a feeling and also a dignity of the other. Giving more support and help than is due means treating the other as worthwhile and enhances confidence, but failing to give support undermines these pistic qualities.

B) *Human aspects*

– Being objective: IS developers must understand what they are doing and why, aware of the concepts and logic they encounter during their projects. This is analytical good. Any confusion or opacity about their tasks, the aim of those tasks, the necessary tools and technologies for conducting them, and so on can result in confusion and doubt. A self giving attitude will take pains to enhance such clarity.
– Acquiring and updating knowledge, skill, and experience: Skills and experience are of the formative aspect, and can enhance achievement by those who possess them. So helping others to acquire them brings extra formative good. Not doing so can make individual failures and organizational mess more likely.
– Applying practical knowledge, skill and experience: Application is a formative functioning. IS developers who make use of practical knowledge can improve the quality of their work. Failure to achieve is the result of impractical application of any of those elements.
– Being involved in improvements in organizations and society regarding IS: IS developers should be involved in activities that can change and improve the current situation in organizations and society; activities such as being innovative in developing IS, producing knowledge, sharing knowledge and etc. The main aspect here is formative. A self-giving attitude leads us to expend extra formative effort, and the structure of society becomes more dynamic and ability to respond to the new, but a self-centred or self-protective attitude discourages and hinders effort and ossifies society.
– Educate, inform and provide enough information about IS so that stakeholders and the public are involved: Providing information is lingual functioning, but the main aspect here, which this serves, that of getting others to contribute, is formative. When others feel unable to contribute this saps their morale and less is achieved.
– Intelligibility of language in communication with others like colleague and employers, avoiding direct or indirect dishonesty: This is of the lingual aspect. Honest, intelligible communication enhances many other aspects, such as mutual understanding, better sharing and management and trust, and is thus worth the extra (ethical) effort. Dishonesty and unintelligibility destroy these.

C) *Social aspects*
– Respecting and protecting ideas, expectations, privacy, and work of others (colleagues, customers, etc.): IS developers need to be aware of others' needs and ideas. This is the social aspect, in that mere awareness is not enough, since they should respect them as well. The social dysfunction of disrespect destroys

friendships and even communities, including that which is the ISD project.
– Justification and evaluation of others: While justification seems juridical and evaluation, analytical, the reason for these is of the social aspect, so that IS developers maintain good relationships with others, stand in appropriate roles, and have appropriate expectations of stakeholders. If this fails, then animosity can result.
– Accurate and proper resource accessibility: IS developers need to access properly and accurately organizational (virtual or real) resources. This concerns resources, so is meaningful in the economic aspect. As Table 2 shows, appropriate access to resources enhances prosperity but inappropriate access can result in destitution which, for IS, can mean failure of project or organisation.
– Avoiding organizational or individual conflict of interest, Awareness of stakeholders' needs and interests, Priorities they might set for others' interest and needs and their own interest and ability, Harmony and integrity with colleagues, employers, organization, customers, and society: This concerns various types of harmony, so is of the aesthetic aspect. IS developers might prefer things different and find others problematic but they should not ignore others and should adjust and integrate with their colleagues, customers, employers, organizational rules and aims, and even society needs and expectations. Such harmonization does not mean putting own needs and preferences aside but rather a focus on balance and flexibility. Failure of people to tune themselves with others can bring about unpleasant, disagreeable, and insensitive relationships and interactions, and yet further disharmony in the team.

D) *Societal aspects*
– Avoiding unfair treats to others: IS developers should avoid unfair treatment of others, whether this is unearned treats or paying too little attention to others. The issue is appropriateness, which is of the juridical aspect. Inappropriateness leads to injustices.
– Avoid discrimination on basis of colour, ethnic origin, etc: Whereas the act of discriminating between people as analytic functioning is good, this issue concerns the basis on which discrimination occurs, that it should never be inappropriate criteria, nor should it results in injustice. So this is of the juridical aspect. A person is a diverse collection of ideas, beliefs, expectations, physical and emotional characteristics, language, understanding level, capabilities, talents and many other factors that make that person unique, and any attempt to reduce them to characteristics like ethnicity is unjust. IS developers should recognise the

multi-aspectual nature of human beings, and treat them with due respect on this account. The consequence of this is not only juridical (injustice) but also pistic, in depriving people of dignity.
– Respecting laws and rules, legitimate rights of organizations' products, services and third parties: Laws and rules are constructed to make organizations and society manageable. As part of society and member of organizations, IS developers should obey laws and rules. This is the juridical aspect, and dysfunction here puts everyone's rights and due in danger.
– Avoiding abuse of others' work and reputation, No abuse of own expertise and experience, or lack of knowledge and experience of others: Issues of abuse are of the juridical aspect, whether of one's own or others' concerns. Abuse, as a form of oppression, impairs people's rights of having contribution or dignity and honour.
– Not cooperating with those who perpetrate fraud: IS developers should be loyal to their organization and society: This is a pistic/faith matter. Loyalty enhances trust, confidence and dignity, but disloyalty destroys these. An IS developer can be disloyal for various reasons, including receiving no credit for what they are doing and not being valued. Taking pains to ensure others are valued is ethical functioning that generates pistic good.
– Self-valuation and self-assessment: Evaluating personal abilities and knowledge is a good way for IS developers to understand their weaknesses and faults, but to do this properly requires an attitude of humility, which is a good in the ethical aspect, since it is a self-giving. If they do not criticize themselves with such an attitude, they cannot gain a clear picture of their own weaknesses and strengths, wrongs and rights. Here, the ethical functioning of self-giving leads to an ethical good.
– Confidentiality and trust in others like customers, colleagues: In a trust-based environment, people can work with more confidence and certainty, which is an important pistic good. Lack of trust between IS developers and colleagues, customers, or employers, hinders communication, which itself hinders the entire project.
– Protecting dignities of individuals, organization, and society: Dignity, at any level, is a pistic good. Failing to protect dignity of others leads to dysfunction in many aspects, including antagonism and inconstancy.

All over this analysis, all Dooyeweerd's aspects from biotic to pistic where applicable are used to clarify consequence(s) of each ethical issue. These are also various kinds of good or bad related to IS use and IS development. Whereas

juridical functioning tries to prevent the bad occurring, ethical functioning not only does this but also aims at increasing the positive good. In any given situation, there might be several types of good-for-others that can be enhanced, and any of them will be useful. It is ethical functioning that creates this extra good.

5. *Discussion and conclusion*

Ethics is part of human life that can guide us in our functioning (Stahl, 2007), including professional life, and especially that of IS developers (Wu, et al., 2001). However, information system units might not clearly include ethical principles in their structures. Studies show that breaking or ignoring them can cause various types of problems in IS projects but understanding of consequences, their diversity and how they link with responsibility, norms and behaviour is in its infancy.

This study has demonstrated that by viewing extant ethical issues through the multi-aspectual lens of Dooyeweerd, possible consequences of each issue may be revealed. This is because, by virtue of Dooyeweerd's notion of a transcendent law side, human functioning cannot be cannot be divorced from consequences and so discussion of each should always involve the other. Further, both functioning and consequences are intimately tied to norms and responsibility, and with his notion of aspects Dooyeweerd can address all four. So the normative issues of (Mason 1986; Forester and Morrison, 1994; Bella, 1992), the responsibility and obligations of (Johnson, 1985), the professional behaviour of (various codes of conduct) and the consequences of (Thomson and Schmoldt, 2001; Chapman, 2006; Wood-Harper, et al., 1996; Rogerson, et al., 2000; Davison and Loch, 2002; McDonald, 2007) may all be understood and integrated within a single framework.

The study has also demonstrated the capacity of Dooyeweerd's suite of aspects to cover a wider variety of types of norm, responsibility, behaviour and consequence. Third, preventing evil and bringing extra good are both acknowledged by Dooyeweerd, one understood as juridical, the other as ethical. His aspects provide the basis for both keeping them conceptually distinct (because aspects are irreducibly distinct) and recognising the relationship between them (via his notions of inter-aspect relationships and multi-aspectual human functioning).

This study is only indicative, not exhaustive, so more work is needed to develop discourse about ethics in ISD along these lines. For example, why is it that certain aspects occurred more frequently than others in the above analysis? There might

be three reasons. One is that our analysis was biased in favour of those aspects; this is unlikely. Another is that in ISD it is these aspects that are naturally most important. That would be expected of the formative aspect, but possibly not of the pistic. The third is that the current discourse on ethics is skewed in favour of certain aspects by the culture that underlies it. Dooyeweerd's aspects can highlight such imbalances, as a stimulus to further research and guide where to most fruitfully direct future effort. In this context, as can be seen, every aspect from biotic to pistic is found in the above analysis. The three mathematical aspects and the physical aspect would not be expected to appear because they do not differentiate between good and bad. However it is also clear that certain aspects appear more frequently than others, especially the formative, juridical and pistic, which occur four times each.
A fuller study needs to be carried out, especially by people from a variety of backgrounds, probably with empirical input and appropriate empirical controls. That remains future work. Such work could also be extended to exploring the conditions necessary for achieving each type of aspectual good.

The process of assigning a single main aspect to issues was relatively straightforward in most cases, but some cases were more challenging, requiring iterative reconsideration and sometimes the splitting of issues. Irreducibility of aspects can be a guide to make information system units aware that each ethical principle by itself is important and it must not be overlooked nor reduced to another one. Also, the relation between aspects can make IS developers and units aware of the link between ethical principles in a way that ignoring one of them will affect functioning of other principles. With this framework, information system units will be able to (re)formulate ethical principles of ISD in a more integrated manner that is aligned with alternative strands such as cultural, economical, social, emotional, and other factors. How alignment is achieved is discussed in Basden (2008).
In the meantime, the exercise above serves to demonstrate that this approach has considerable potential. It was relatively straightforward to find everyday examples of types of aspectual good and these can be related quite easily to extant discussion, to enrich that discussion. Because aspects are claimed by Dooyeweerd to transcend humanity, and indeed be the enablers of human living that is meaningful and good, they enable us to look forward to the future rather than be restricted to extrapolating from past experience. So, with Dooyeweerd's aspects, innovative ways of thinking about both past experience and future

possibility can be encouraged. Moreover, for the same reason, this approach should be applicable across different cultures; the two authors are from very different cultures: Iran and Britain. Thus we recommend this Dooyeweerdian approach to thinking about and discussing the variety of ethical issues and the consequences of breaking or fulfilling ethical principles.

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