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# Impact of ERP implementation on the quality of work life of users: A sub-Saharan African study

Research Paper

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## ABSTRACT

ERP implementations have a disruptive impact on users and in sub-Saharan African (SSA) countries they are more problematic than in developed countries. Extant ERP literature has not focused on the impact of implementations on users work life. Therefore this research aimed to confirm this impact on SSA users' work life. A theoretical framework and survey was developed from Dooyeweerd's "Down-To-Earth" aspects and the Easton and Van Laar Work-Related Quality of Life scale. Responses from users from 7 countries working for one case organization were analyzed. The significant effect of an ERP implementation on work life quality was confirmed. Cultural differences were also confirmed. The factors mostly accounting for work life quality impact were skills development and an improvement in working conditions due to a reduction in corruption pressure. The framework and research instrument can be used by organizations to assess the impact of an ERP implementation on user work life quality.

## Keywords

ERP implementation, SAP, ERP impact, Quality of Work Life, Sub-Saharan Africa, ERP.

## INTRODUCTION

Organizations have implemented Enterprise Resource Planning (ERP) systems to solve fragmentation issues in organizational information and provide a platform on which to compete (Wickramasinghe and Karunasekara, 2012). Yet, successful ERP implementations and operations have often eluded

organizations, with failures derailing these expected benefits. Because of the importance and cost of these implementations ERP research has focused on determining factors which impact implementation success (Shaul and Tauber, 2013). These studies focus on identifying these critical success factors through case studies so as to improve the chances of a successful ERP implementation and operation. In their resultant findings, these studies present a plethora of best practices and considerations for organizations in avoiding potential issues (Botta-Genoulaz and Millet, 2005).

However, it is the everyday engagement of users with ERP systems that determines whether ERP benefits are obtained (Ahmad & Basden, 2013; Ali & Younes, 2013). An ERP implementation can impact employees deeply, affecting the nature of their work and with resultant high emotive responses (Seymour and Roode, 2008). Yet extant ERP research is uneven and fragmented, focussing on narrow managerial and technical perspectives and ignoring social and user considerations (Svejvig, 2013).

ERP implementations in developing countries have increased partly due to aggressive marketing by ERP vendors (Dezdar, 2012; Huang, Hung, Chen, and Ku, 2004). In comparison to developed countries, these countries display higher rates of ERP adoption failure (Dezdar, 2012; Jansen van Vuuren and Seymour, 2013). Yet the ERP implementation literature by and large discusses implementations in developed settings (Shaul & Tuaber, 2013). While there have been recent studies in Asian, Eastern European and Middle East countries (Dezdar, 2012; Hung et al., 2013), African and other developing countries remain understudied (Mohammad Reza, Asefeh and Mohammad, 2010; Soja and Weistroffer, 2016).

Considering the importance and impact of ERP systems and the lack of social and user ERP research and the lack of research in African contexts, the following research question emerged: What is the impact of the introduction of an ERP system on the work life of sub-Saharan African users? To answer this question, this paper first reviews the literature and then proposes a framework, the methodology section describes the case study and presents the survey instrument and then the findings describe the results of the qualitative and quantitative analysis.

## LITERATURE REVIEW

Extant literature provides numerous definitions for ERPs as a result of a diversity of opinions and contexts in ERP systems use (Boersma & Kingma, 2005; Otieno, 2010). While we acknowledge the entanglement and socio-materiality of information systems (Cecez-Kecmanovic et al. 2014), in this study we use the technology or material definition to enable us to explore the relationship between the social and material (in this case the ERP) (Mutch, 2013). Hence, an ERP is defined as an enterprise-wide application software package that helps solve the fragmentation issues in organizational information, by automating and integrating key business processes, providing real-time information with regards to these processes, and allowing cross-departmental sharing of common data and practices within an enterprise (Gefen and Ragowsky, 2006; Khaparde, 2012). Using ERPs to integrate business processes and information, companies have realized benefits in improved planning and decision making, enhanced coordination capabilities and efficiency, and agility in responding to customer requirements (Chang, Cheung, Cheng, & Yeung, 2008; Sadrzadehrafiei, Chofreh, Hosseini, & Sulaiman, 2013). These assurances of business success have lured organizations into implementing ERPs to assist in adapting to a changing competitive global environment (Metaxiotis, 2009; Ali and Younes, 2013). As one of the most significant IS investments, these enterprise systems require significant costs, time and expertise (Gefen and Ragowsky, 2006). From the significant amount of research identifying ERP critical success factors, differences in implementation success factors between developed and developing countries have been identified.

## The Sub-Saharan African Context

A number of studies have discussed the fundamental cultural differences existing between different nations due to which business practices are often dissimilar (Davison, 2002; Rajapakse and Seddon, 2005). Although ERPs are global products, these systems have typically been developed in developed countries and are more likely to be problematic in SSA due to economic, cultural and infrastructure problems (Otieno, 2010). Studies have shown that national and organizational issues also have a radical and varied impact on the implementation of ERP systems, which is pronounced in a developing economy context (Huang and Palvia, 2001; Soja and Weistroffer, 2016). A claim also made is that ICT infrastructure underpinning these projects is often ahead of developing country institutions' competence and commitment (Dwivedi et al., 2015). Huang and Palvia (2001) argue that cultural differences, basic infrastructure, economic circumstances, governmental policies, lack of ERP experience and general maturity, are barriers to adoption in developing countries.

Developers of ERP systems draw upon known sources of knowledge such as markets where the software has a major presence in designing and developing software and so-called best practices (Seymour and Roode, 2008; Soh, Kien and Tay-Yap, 2000). These best practice templates are regarded as one of the primary causes of misfit between the organizational setting and the design of the ERP (Wang, Klein and Jiang, 2006). Consequently, organizations not originating from these known markets, may find that the assumptions on which the ERP systems were designed, to be in conflict with work practices (Soh, Kien and Tay-Yap, 2000). Hawari and Heek's case study in Jordan (2010), attributed partial failure to the lack of fit between the organizational setting and the ERP introduced. A Middle-Eastern case study found that an ERP implementation partly as a result of enforcing business practice changes to align with the system recommended practices (Al-Mashari & Zairi, 2000). It has been found that developing countries do underestimate process change (Moohebat, Asemi and Jazi, 2010) and the effect national cultures have on the ERP implementation (Wong, Scarbrough, Chau, and Davison, 2005; Otieno, 2010; Shaul & Tuaber, 2013).

The cultural dimensions of power distance and individualism have been found to be highly relevant to ERP system use as they relate to how people work together (Rajapakse and Seddon, 2005) Hofstede's (1993) cultural study found that Africans differ considerably from their North American and European counterparts in measures of power distance, individualism, masculinity, uncertainty avoidance and long term orientation. Africans are rated high in terms of power distance, being seen to accept that power is distributed unequally tending towards centralized decision making as the norm (Hofstede, 1993; Hawari and Heeks, 2010). This can be a concern for managers in SSA countries, who might be uncomfortable with information sharing among employees, while information sharing is assumed in ERP design (Boersma and Kingma, 2005). Africans are rated low on individualism having a tendency towards being loyal within social groupings (Rajapakse and Seddon, 2005; Hawari and Heeks, 2010). In contrast, a high individualism rating enables engagement with an ERP project (Hawari and Heeks, 2010). Hence ERP use may face difficulties in organizations with strict hierarchies and line reporting (Marnewick and Labuschagne, 2005).

## The Importance of the ERP User

The nature of technology-mediated organizational change experienced as part of an ERP implementation, is complicated and resource intensive, holding a considerable degree of risk (Volkoff, Strong, & Elmes, 2007). Social factors have been shown to play a significant and determining role in the successful usage of an ERP system (Beaudry & Pinsonneault, 2005). Empirical research indicates that

the extent to which the ERP positively impacts an individual's current job, significantly influences usage of the ERP (Ali & Younes, 2013; Chang, Cheung, Cheng, & Yeung, 2008).

Users' concerns in the introduction of ERPs are found to be more prevalent in emerging economies (Jansen van Vuuren & Seymour, 2013). An implementation in Jordan identified dissatisfaction regarding minimal user involvement in the implementation process, inaccurate data on the new system, and low levels of use (Hawari & Heeks, 2010). A failed Middle-Eastern implementation attributed failure to early user resistance along with management's lack of communication in addressing user concerns (Al-Mashari & Zairi, 2000). A case study on two South African organizations identified additional work load, communication issues, anxiety in organizational change, project control, lack of adequate training and documentation as key factors in ERP adoption (Jansen van Vuuren & Seymour, 2013).

Ahmad & Basden (2013) state that extant research approaches using models with constructs focus primarily on supplier aspects, senior management concerns and the goals of the researcher, without adequate focus on the actual user's issues. Examining these everyday activities of users in their engagement with ERP systems determines whether the quality of its use is high or low (Ahmad & Basden, 2013). For example, providing the capability for users to work at any time from remote locations is a key finding in studies focussed on adoption and improved performance (Ali & Younes, 2013; Jansen van Vuuren & Seymour, 2013). Hence, while descriptive and exploratory literature confirms that the impact of an ERP implementation on users especially within Africa is high and is important, these studies have no strong theoretical backing and no quantitative evidence. Hence, this study proposed to fill this gap.

### **Theoretical Underpinnings of the Impact of IS Use on the Life of Users Applied to ERP**

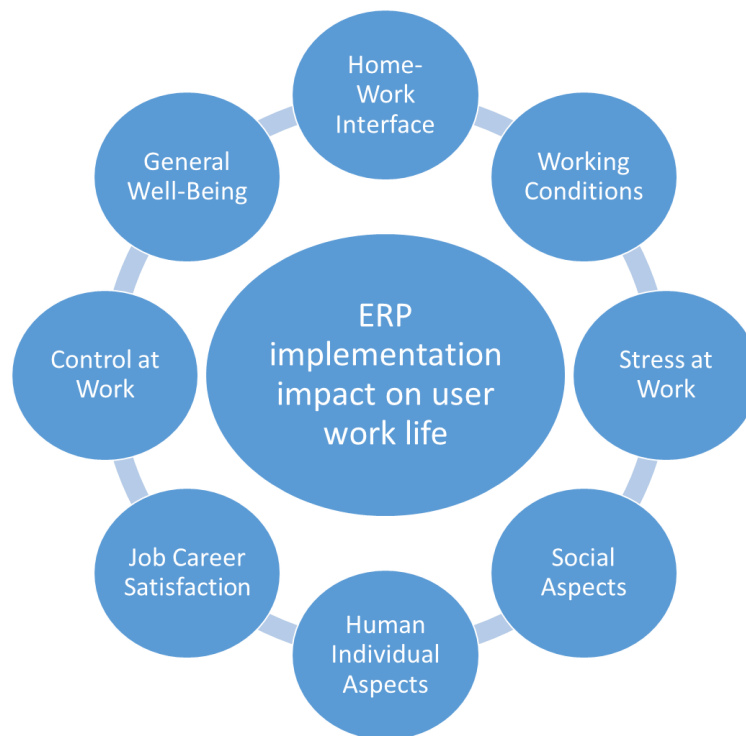
Walsham (2012) suggests future research aspects should focus on improving the world in which we live. Adapting IS research towards this perspective could achieve a better understanding in associating everyday benefits as a result of the technology in use. Ahmad (2013) terms these everyday issues "Down-To-Earth" (DTE) issues and proposes Herman Dooyeweerd's suite of fifteen aspects from his philosophy of everyday life, as the conceptual tool in exploring these concerns. The notion of DTE is based on the perception that everyday activities, beliefs, encounters and aspirations, have an impact on the users and their engagement with information systems (Ahmad & Basden, 2013). Critical social IS research has linked the DTE approach to Quality of Work Life (QWL) broadening out the values of the measures (Klein, 2009). Prior research has noted that ERP implementations affect users job performance at an individual emotional level (Seymour and Roode, 2008). Therefore our first theoretical underpinning involved applying the DTE approach to QWL to ERP implementations resulted in the formulation of our first two high level hypotheses:

*H1. The introduction of the ERP system has an effect on human individual aspects.*

*H2. The introduction of the ERP system has an effect on social aspects.*

To consider these impacts more deeply we choose a second theoretical underpinning. QWL has as a concern the effect of working life on health and general well-being and is considered important in predicting the sustainability and viability of an organisation (Sheel, Sindhwani, Goel and Pathak, 2012). Multiple factors impact QWL (Sheel, et al., 2012). In general, QWL is used to describe the broader job-related experience an individual has within a specific role in an organisation. Work-Related Quality of Life (WRQoL) comprises six key factors to explore the core aspects in working life (Van Laar, Edwards and Easton, 2007). The framework aims to capture the essence of an employee's work experience and achieves its goals by measuring the aspects of job and career satisfaction (JCS), general well-being

(GWB), home-work interface (HWI), stress at work (SAW), control at work (CAW), and working conditions (WCS) (Easton and Van Laar, 2012). The final proposed ERP QWL impact framework is therefore presented in Figure 1.



**Figure 1. Proposed ERP QWL impact framework**

Applying the WRQoL theory to the introduction of an ERP resulted in the formulation of our remaining hypotheses:

- H3. The introduction of the ERP system has an effect on job and career satisfaction.*
- H4. The introduction of the ERP system has an effect on home-work interface.*
- H5. The introduction of the ERP system has an effect on stress at work.*
- H6. The introduction of the ERP system has an effect on working conditions.*
- H7. The introduction of the ERP system has an effect on control at work.*
- H8. The introduction of the ERP system has an effect on general well-being.*

GWB assesses how an individual feels with regard to their life as a whole and incorporates the broader well-being of the individual. HWI assesses the work life balance and the degree of control over how work is accomplished with the support of the employer. The JCS and WCS constructs replicate Herzberg's Hygiene Theory (Herzberg, 1966) and Maslow's Higher Need Theory (Maslow, 1954). JCS reflects the degree to which a workplace provides the individual with the best work conditions, while WCS assesses the very basic conditions. CAW assesses the subjective extent to which an individual feels he or she is able to exercise control at the work place. SAW deals with the individual's perception as to the excessive pressures and stress at work (Van Laar, Edwards and Easton, 2007; Easton and Van Laar, 2012). Based on the research context, this study chose to merge the DTE and WRQoL frameworks to assess the impact of an ERP implementation on the quality of work life of employee users.

## RESEARCH METHODOLOGY

Based on the context of the research and the literature reviewed, the objective of this research was to investigate the impact of the introduction of an ERP system on employees work life within a SSA context. In order to obtain a wide regional spread, we opted for a positivist, deductive, cross-sectional case-study approach, using a survey as the main instrument to collect quantitative as well as qualitative data. Documentary secondary data was used in this study to understand historic and other retrospective information (Hurworth, 2005) relating to the ERP implementation. This data was collected from meeting minutes and reports to project sponsors and shareholders.

### Case Selection and Sample Strategy

ERP implementations are highly contextual and certain implementations are more successful than others and hence have different impacts (Uwizeyemungu and Raymond, 2012). The budget, expertise of the organization and implementation team and implementation approach can have a big impact on how users experience the implementation as well as the quality of the resultant ERP system. For this case study, a large multinational organization was chosen. The organization had been using SAP ERP products since 1989 and hence was experienced with the software, the associated work practices and implementation methods; it had sufficient budget for the implementation. The specific industry of this organization is mostly regulated by local governments, and therefore process and process changes are also regular occurrences in the organization. The corporate head office is situated in Cape Town, South Africa and hosts a centralized ERP system. The ERP system had been (within the 3 years prior to this study) rolled out to 7 further SSA countries: Kenya, Malawi, Mauritius, Mozambique, Reunion, Zambia and Zimbabwe. It is this further implementation which constituted the ERP implementation case selected. As part of the country rollouts for this study, training was provided to each and every user of the ERP system.

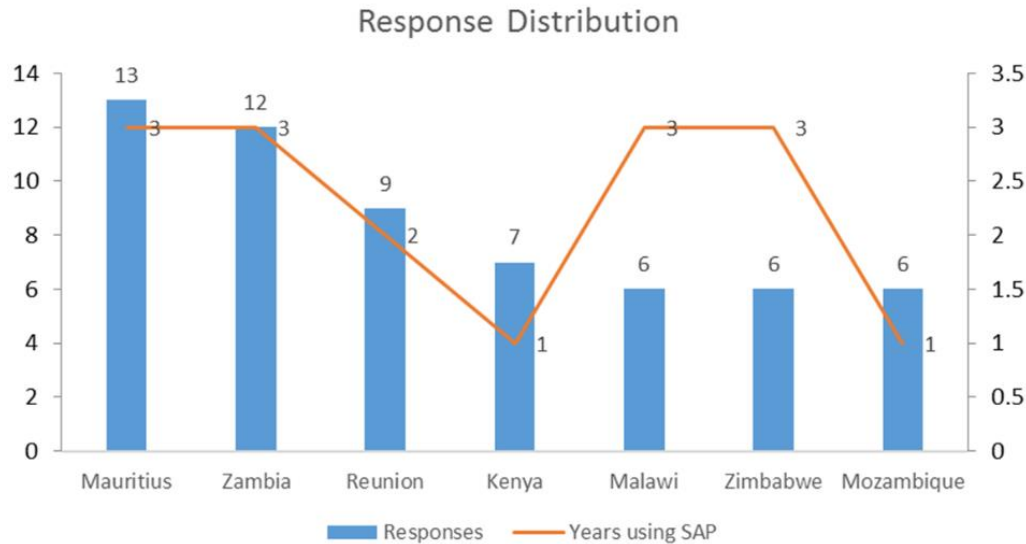
This study used a census approach to obtain and analyze data from every possible suitable member of the population (Saunders, Lewis and Thornhill, 2012). The sample population totalled 180 direct users of the centralized ERP system from the 7 countries. Participation was entirely voluntary and all organizational and personal identifiable information remain confidential. Ethics approval was obtained from the University of Cape Town, and permission to survey the organization's users was obtained from the organization's Chief Information Officer. The survey instrument consisted primarily of 5-point Likert scale questions with some open ended qualitative questions as well as a number of demographic questions. Many of the Likert scale questions were adapted from a QWL instrument, which has been extensively tested in the UK, although the scores for negatively phrased questions were reversed in the tool. The questionnaire was assessed and tested for validity by using a pilot study group and minor changes were subsequently made.

### Survey Responses and Demographics

A total of 74 responses were obtained, 13 were deemed insufficiently completed, 1 response was invalid with too many of the same answer selected, leaving 60 valid responses representing 33% of the population (i.e. entire user group). The location of the participants was obtained using the IP addresses and the date of the implementation from document analysis. Figure 2 shows the distribution of the responses according to the country including the number of years (between 1 and 3) since the ERP implementation.

The 60 responses were spread across all the countries with no country having an outright majority, 37% of respondents were from SSA Indian Ocean islands (Reunion and Mauritius). The education level

demographic question in the online survey was divided into four categories. These included “High School”, “Professional Qualification”, “College or Diploma” and “University Degree”. Most (88%) of the respondents have an education beyond high school with a degree, diploma or qualification. Notably 45% of the participants have a university degree.



**Figure 2. Distribution of responses by country and years since the ERP implementation**

## Quantitative Analysis

Construct reliability indicates how robust the questions are in producing consistent findings with differing times, conditions and samples (Saunders et al., 2012) and was calculated using Cronbach’s Alpha coefficient for the various constructs. A Cronbach’s Alpha of at least 0.7 is normally required to confirm that questions in the construct are measuring the same thing. Table 1 shows that the scores for all variables except Stress at Work load well.

Construct/Aspect	Questions	# of Items	Cronbach Alpha
Human Individual Aspects (HI)	HI1R, HI2, HI3R, HI4, HI5	5	0,718031
Social Aspects (SOC)	SOC1R, SOC2R, SOC3, SOC4, SOC5, SOC6	6	0,833336
Job and Career Satisfaction (JCS)	JCS1, JCS2, JCS3, JCS4, JCS5, JCS5	5	0,811038
Home-Work Interface (HWI)	HWI1, HWI2, HWI3	3	0,775692
Stress at Work (SAW)	SAW1R, SAW2R	2	0,648105
Working Conditions (WCS)	WCS1, WCS2, WCS3	3	0,715458
Control at Work (CAW)	CAW1, CAW2, CAW3, CAW4	4	0,795712
General Well-Being (GWB)	GWB1, GWB2R, GWB3, GWB4, GWB5, GWB6	6	0,810019

**Table 1. Item Reliability Analysis Data**

Factor analysis with Varimax normalized factor rotation, was used to measure the validity of the questions within their constructs. The variables did not load well together (Table 2) so the constructs were determined to be formative rather than reflective and therefore high level analysis was not done (Marakas, Johnson and Clay, 2008, p. 538).



Factor Loadings (Varimax normalized), Extraction: Principal components. (Marked loadings are >.600000)							
Variable	Factor (1)	Factor (2)	Factor (3)	Factor (4)	Factor (5)	Factor (6)	Factor (7)
HI1R	0.0057	<b>0.8824</b>	0.1387	0.1011	0.0686	0.0576	0.1983
HI2	0.3627	0.1011	<b>0.6931</b>	0.2189	-0.1548	0.1503	0.0938
HI3R	-0.1197	0.1862	<b>0.6718</b>	-0.0642	0.1517	0.1945	0.1797
HI4	<b>0.6351</b>	0.2036	0.3635	0.0886	0.0729	0.3390	-0.0466
HI5	0.2626	-0.0349	<b>0.6187</b>	-0.0345	0.0429	0.3946	0.1359
SOC1R	0.0396	<b>0.8935</b>	0.2184	0.0952	0.1183	0.1284	-0.0614
SOC2R	0.2239	0.3072	0.3767	-0.0073	0.0912	0.1057	<b>0.6272</b>
SOC3	0.0820	0.2345	<b>0.7533</b>	0.4330	-0.1235	0.0761	0.0047
SOC4	0.3399	0.0848	0.5256	0.0897	0.1267	0.4409	0.2065
SOC5	0.3854	0.1266	<b>0.7062</b>	0.2582	-0.0871	0.1103	-0.0651
SOC6	0.1586	0.2158	<b>0.6906</b>	0.3142	-0.0525	0.0667	0.1038
JCS1	0.5397	0.0284	0.5904	0.1622	0.0860	0.1912	-0.0146
JCS2	-0.0917	0.1198	0.2280	0.4106	0.1453	<b>0.6082</b>	0.1197
JCS3	0.2865	-0.2033	0.4368	0.5029	0.1171	0.1960	-0.1002
JCS4	0.3914	-0.1061	0.3807	0.2385	0.0811	<b>0.6448</b>	0.0417
JCS5	0.1680	0.1492	0.2254	0.3077	0.0217	<b>0.7411</b>	-0.0538
CAW1	0.5938	0.0774	0.3142	0.2209	0.0001	0.3457	0.1264
CAW2	<b>0.6752</b>	-0.0070	0.0114	-0.0544	0.0165	0.5069	0.2939
CAW3	0.2073	0.1285	0.1438	0.1934	-0.0540	<b>0.7940</b>	0.1014
CAW4	0.2067	-0.0013	0.0440	0.4288	-0.1180	0.4120	0.5456
GWB1	0.3672	-0.0294	<b>0.6164</b>	0.2666	0.1203	0.2209	0.1988
GWB2R	0.0772	-0.1782	0.3401	0.1092	0.5748	0.4219	-0.0758
GWB3	-0.0938	0.2771	0.4145	0.4039	0.2025	0.4176	0.2065
GWB4	0.4282	-0.1068	0.4297	0.3790	-0.0153	0.0275	0.4101
GWB5	0.0799	0.1581	0.4854	0.5753	-0.0028	0.3319	-0.0118
GWB6	0.1175	0.1308	0.2024	<b>0.7285</b>	0.0592	0.1446	-0.0174
HWI1	<b>0.6402</b>	0.0758	0.2546	0.3861	0.1931	0.0658	0.1634
HWI2	0.2277	0.0157	0.1699	0.5244	0.2002	0.4723	0.2703
HWI3	0.1523	0.1703	0.1181	<b>0.7507</b>	-0.0711	0.1196	0.3230
SAW1R	0.1275	0.1659	-0.1777	-0.0803	<b>0.8180</b>	-0.0127	-0.2694
SAW2R	0.0477	0.1237	0.0077	0.0303	<b>0.7928</b>	0.0031	0.3314
WCS1	0.2989	-0.1569	0.5145	0.5354	-0.0172	0.3088	0.1093
WCS2	0.5656	-0.2517	0.1700	0.3951	0.0950	-0.1364	0.0446
WCS3	0.1839	0.0030	0.0587	<b>0.7676</b>	-0.0898	0.3068	-0.0704
Expl.Var	3.7230	2.3250	5.9484	4.5922	1.9764	4.1482	1.6574
Prp.Totl	0.1095	0.0684	0.1750	0.1351	0.0581	0.1220	0.0487
Cumulative %	40.3077	47.5832	53.8898	59.9460	64.4531	68.6068	71.6783

Table 2. Factor Analysis Loading of Variables

Question	Code	Mean	t-value	p
* Test item as phrased originally; for statistical analysis scores (and, thus, meaning) were reversed				
The SAP system assists me in making more informed business decisions based on system information	HI4	4,1000	11,6796	0,0000
The SAP system encourages communication within the organization	HI5	4,0667	10,0682	0,0000
SAP does not align very well with the culture of the organization*	SOC2R	4,0500	8,4353	0,0000
My set of work goals and aims have become more clarified, and thus enabled me to do my job better	JCS1	3,9167	8,5613	0,0000
I am more encouraged to develop new skills	JCS5	3,8833	8,5053	0,0000
I personally think that the organization was more efficient before the introduction of SAP*	SOC1R	3,8500	6,4410	0,0000
In my personal opinion there is a healthier organizational culture	SOC3	3,8500	7,4851	0,0000
I feel that I work in a safer working environment	WCS2	3,8500	7,8363	0,0000
My work life is more enriched	SOC5	3,8000	6,8990	0,0000
I am able to manage my time more efficiently	SOC4	3,7833	7,1759	0,0000
My unhappiness and depression at work has increased*	GWB2R	3,7667	6,4041	0,0000
On the whole, I preferred the way things were done in the organization before the introduction of SAP*	HI1R	3,7500	5,6109	0,0000
High individual performance ratings are more achievable	HI2	3,7500	6,2333	0,0000
More opportunities have been provided for me to use my abilities at work	JCS4	3,7333	7,1030	0,0000
The organizational climate and culture has improved	SOC6	3,7000	6,3811	0,0000
I am more involved in decisions that affect me in my own area of work	CAW3	3,7000	5,8550	0,0000
My line manager actively promotes more flexible working hours / patterns	HWI2	3,6833	5,8092	0,0000
I am more satisfied with the overall quality of my working life	OVL1	3,6667	5,8912	0,0000
My employer is better able to provide me what I need to do my job effectively	WCS1	3,6333	6,1182	0,0000
I am more able to influence changes in my area of work	CAW2	3,6333	5,8191	0,0000
I feel more able to voice opinions	CAW1	3,6167	5,7880	0,0000
My feeling of wellness at work has increased	GWB1	3,6167	5,7880	0,0000
Generally things have worked out better for me	GWB5	3,6167	5,5198	0,0000
The quality of the work we do has decreased	HI3R	3,5833	4,3872	0,0000
I feel I am more satisfied with my work life	GWB3	3,5833	4,7862	0,0000
When I have done a good job it is acknowledged by my line manager	JCS2	3,5667	4,5573	0,0000
I feel happier all things considered	GWB6	3,5500	4,8863	0,0000
I am more satisfied with the career opportunities available to me	JCS3	3,5000	3,6344	0,0006
The working conditions are better	WCS3	3,4500	3,9116	0,0002
My working hours / patterns suit my personal circumstances better	HWI1	3,4333	3,4850	0,0009
My employer is able to provide better facilities and flexibility for me to fit work in around my family life	HWI3	3,4333	3,2045	0,0022
I am more involved in decisions that affect members of the public in my own area of work	CAW4	3,3667	3,0873	0,0031
I often feel higher levels of stress at work*	SAW2R	3,3333	2,4169	0,0188
I feel that in most ways my life is closer to ideal	GWB4	3,2667	2,2965	0,0252
I often feel more under pressure at work*	SAW1R	3,1500	1,2185	0,2279

**Table 3. Quantitative Survey Questions and t-values**

The purpose of t-tests for single means is to test hypotheses from a population mean when the variance is unknown and compared to an expected reference mean of the population. Table 3 presents the survey questions, their mean value and t-value sorted by mean value. Since a 5-point Likert scale from strongly

disagree (1) to strongly agree (5) was used in the survey, all t-tests were done using a reference value of 3 (neither agree nor disagree) for a single sample. To quantify the strength of relationship between variables for future studies, Pearson's product moment and correlation coefficient (PMCC) was used (Saunders et al., 2012) and correlations were found (Appendix 1).

### Qualitative Analysis

The optional qualitative or open ended questions included in the online survey are presented in Table 4 with the number of respondents. While question 3 had insufficient usable responses, the responses to the remaining questions were analyzed using thematic analysis (Braun & Clarke, 2006). Textual responses were grouped into themes in line with the theoretical framework and classified as either a negative or positive comment. The number of occurrences of each theme was then counted.

Question	Responses	Response "None"
1. What are the 3 major benefits on your work life and your well-being that has been impacted as a result of SAP being implemented?	45	0
2. In your opinion, what are the 3 most negative aspects that SAP has introduced?	46	9
3. Are there any other areas of your social or professional environment which have been impacted by SAP that are not mentioned above?	33	30
4. Any other comments, positive or negative, about the introduction of SAP?	33	8

**Table 4. Qualitative Questions and Responses**

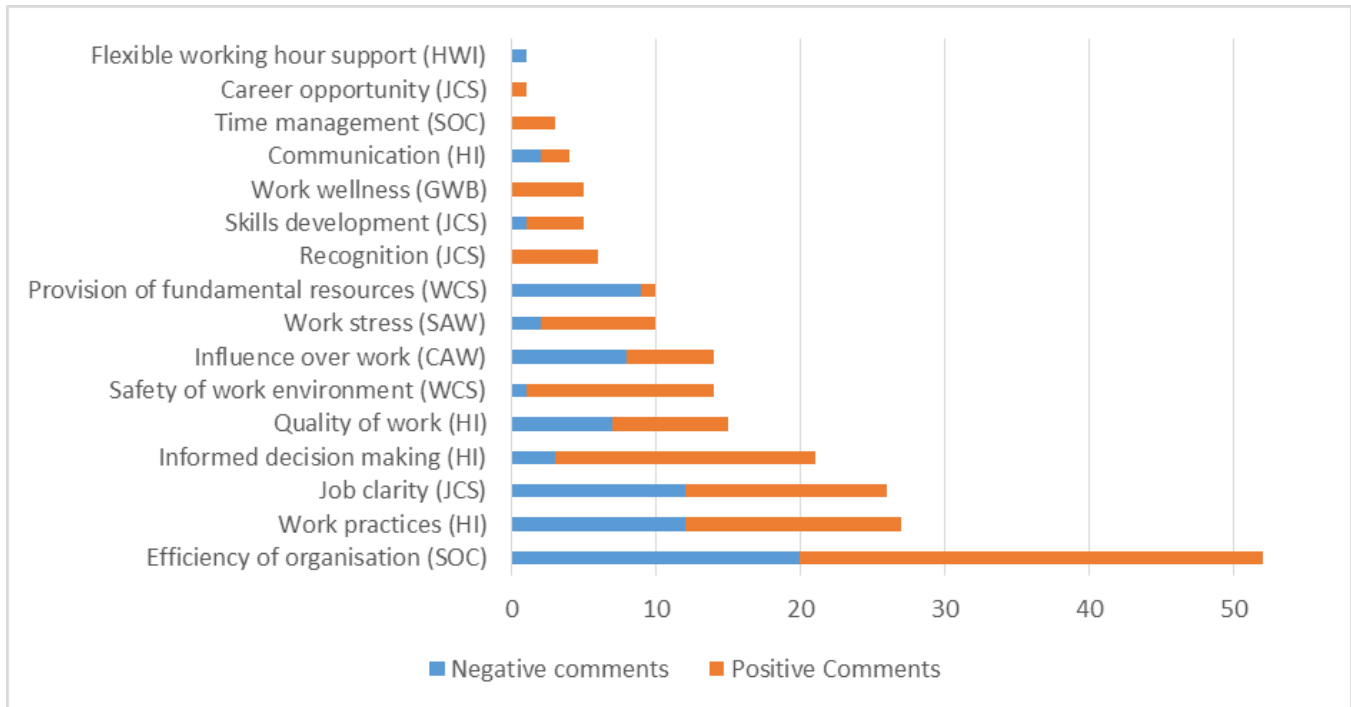
### Limitations of this Research

In terms of data collection, 60 valid responses were obtained for the survey, representing 33% of the organization's entire ERP user population. While this may be sufficient for most quantitative tests, 100 responses would have been preferred. In retrospect, offering the survey in Portuguese and French may well have endeared more participants to the research, resulting in an even higher response rate. In terms of data analysis, statistics on multiple item constructs could not be performed. Although the WRQoL scale has been validated in other studies, adapting the questionnaire to infer change since the ERP introduction could be contributing factors to the invalidated constructs. The survey was distributed by the organization and was positioned as being beneficial for the organization. It is therefore possible that the participants were positively biased towards the survey because of the work association of the survey even though they were assured of their anonymity. A further limitation is that only one organization, albeit a large multinational, was studied.

### FINDINGS AND DISCUSSION

In terms of the quantitative analysis (Table 3), 34 of the 35 answers were 95% ( $p < 0,05$ ) significantly different from neutral and 32 of 35 answers were 99% ( $p < 0,01$ ) significantly different from neutral. Hence all 8 hypotheses were supported in that the introduction of the ERP had an effect on the work life of users. In all these cases the effect was positive. The one hypothesis that was weakly supported was stress at work. For the qualitative questions respondents were asked to give 3 positive, 3 negative as well as any other comments on the introduction of the ERP system. The themed responses are shown in Figure 3. More positive than negative comments were given and most of the comments refer to the change in efficiency of the organization, its work practices and decision making as would be expected with the implementation of an ERP. However the large amount of comments referring to job clarity and

safety and influence over work is interesting. The comments will be discussed with the relevant quantitative data in the following sections.



**Figure 3. Themes for qualitative comments**

### Human Individual and Social Aspects

The findings indicate that the introduction of the ERP system had a positive effect on human individual and social aspects (Figure 4). The human individual questions emerged from analytical, formative and lingual aspects. The introduction of the ERP improved these aspects with decision making (HI4) and organizational communication (HI5) improving the most. The remaining results indicate that the participants perceived improvements in business practices (HI1R), achievability of high performance ratings (HI2) and quality of work (HI3R). In the open ended section, respondents did not comment explicitly on achievability of high performance ratings but they did comment on job clarity which is discussed under job/career satisfaction. Comments on decision making mostly were positive and referred to the improved and real-time reports that were available with the ERP.

Comments on work practices changes were positive as well as negative. Positive comments referred to ease of use, computerization, integration, convenience and structure while negative comments referred to lack of user friendliness, complexity of practices and an inability to perform some operations:

*“Systematic - There is less haphazard way of doing work”*

*“Just the way some things that affect operations are done need to be changed or considered for change or better still improved upon”*

In terms of quality of work the main comments referred to problems when there were network or performance problems when connecting to the ERP system: this impacted customers. Also, customers complaining about struggling to understand the relevant reports or documents which had changed.

Positive comments included a reduction in backlogs and an improvement in data quality in terms of accuracy and consistency due to controls in data entry:

*“Customers have challenges in matching up an invoice with the loading advice”*

*“Customers usually gets affected when SAP is down”*

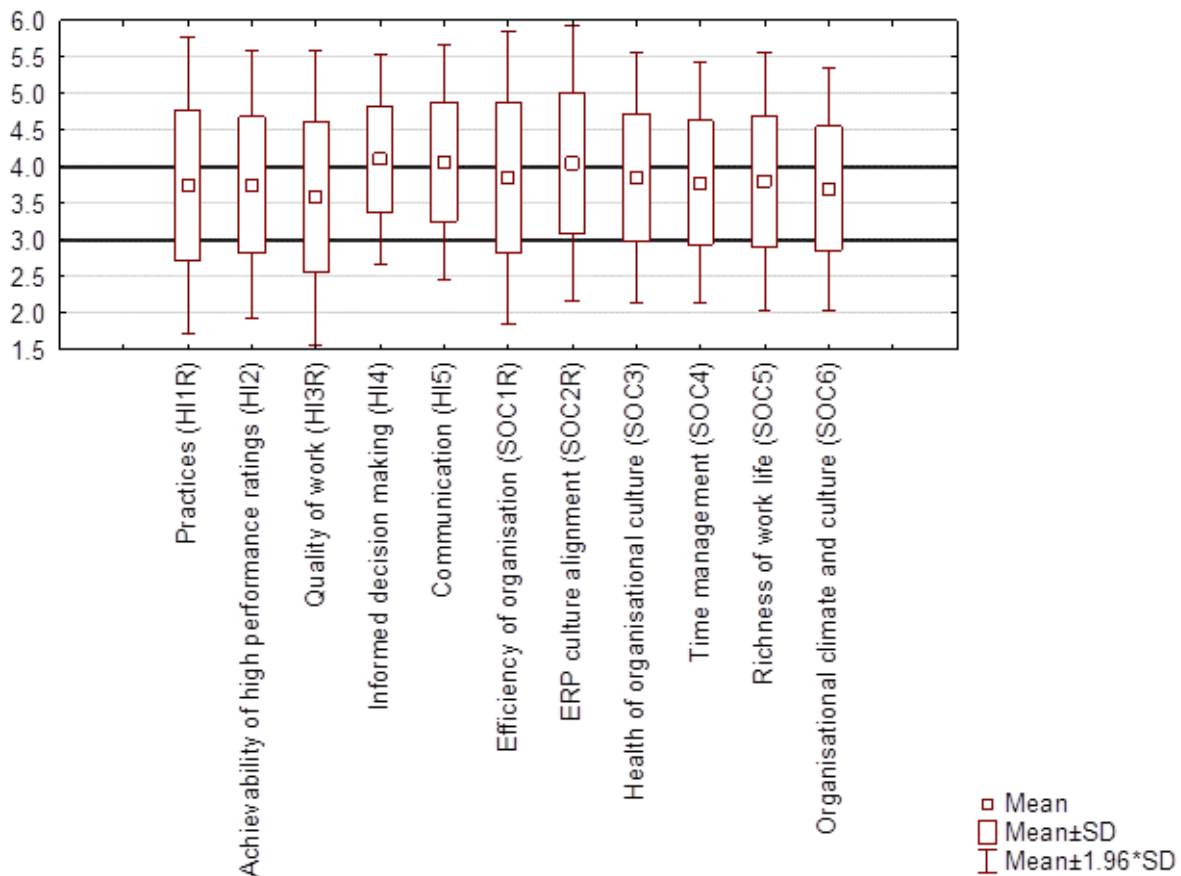
*“System helps you to catch potential mispostings before they occur”*

*“Accurate data, and consistency”*

Respondents commented the least on communication, but their comments included negative and positive comments regarding both internal and external communication:

*“Loss of vital information due to lack of proper communication between parties involved”*

*“Promotes pro-active communication with colleagues in the same line of processing flow”*



**Figure 4. Human Individual and Social responses**

The social aspects assess the respondent’s interpretation of the change in productivity (SOC1-R, SOC4), organizational culture (SOC2-R, SOC3, SOC6), and aesthetic work life (SOC5). The aspect that improved the most was the alignment of organizational culture with the ERP. The company in question conducts regular organizational culture surveys and roadshows to reinvigorate the corporate values. The qualitative comments were dominated by productivity comments and most of these were positive. Positive comments referred to time savings, real-time processing, less manual work, being able to

perform tasks in parallel, less reliance on paper and easy retrieval of online information. Negative comments were mostly related to slow network problems and the ERP being down with a few comments relating to longer processes:

*“So many processes to go through before achieving one simple job, hence timing consuming”*

*“On SAP downtime for long periods we are limited in running effectively the business since we are very dependent on SAP.”*

*“System helps you do today's business today.”*

*“Able to attend to more than one client at a go”*

*“It has made planning for my time easier as I can check for information in one place and follow up where there are gaps”*

### **Job/Career Satisfaction and Home-Work Interface**

Job and career satisfaction represents the level at which an organization provides an employee with a sense of achievement and high self-esteem (Easton and Van Laar, 2012). The introduction of the ERP system had a positive effect on job career satisfaction (Figure 5). In terms of ranked significance, job clarity (JCS1) and skills development (JCS5) are the most significant. These aspects are then followed by job growth (JCS4), recognition (JCS2) and finally career opportunities (JCS3). The JCS factors were the most statistically significant of the WRQoL scale factors. Since the introduction of the ERP, the organization provides the participants with better achievement of personal development and recognition. The qualitative analysis was predominantly positive and most comments were around job clarity:

*“It has clarified job roles in my department and how we can work with supporting departments”*

*“Everyone is accountable for their actions hence are careful in how things are done”*

*“I am able to monitor my performance”*

*“SAP is a world class recognised ERP and adds value to my CV”*

*“I would just hear people boast of their skills in SAP and kept imagining, now that I am a user, it's humbling to know I am conversant with sections I use for my work”*

Yet the job clarity, and mainly the segregation of duties as implemented with the ERP, was seen to be negative by some users and not appropriate for their business model:

*“Some SAP functions not directly related to a job function is not clear. Mauritius with limited staff has several staff that are multi-tasked and carries out more than 1 function in the organisation”.*

*“There are problems when a person who was given rights to do a certain transaction is not available since one individual is not permitted to carry out several transactions”.*

Home-work interface assesses the work-life balance and the degree to which individuals feel empowered over how work is done (Easton and Van Laar, 2012). In terms of ranked significance, Figure 5 shows that support of flexible working hours (HWI2) is the most improved aspect. Personal circumstance in relation to working patterns (HWI1) and family life flexibility (HWI3) are the other improvements. Hence the introduction of the ERP system has a positive effect on home-work interface. The introduction of the ERP appeared to make work more efficient and therefore benefitted the

participants and allowed the organization to benefit from getting the best from the employees. However one user did comment negatively that flexible hours were not really supported:

*“It can only be accessed at the office so work can only be done at the office and none carried home”*

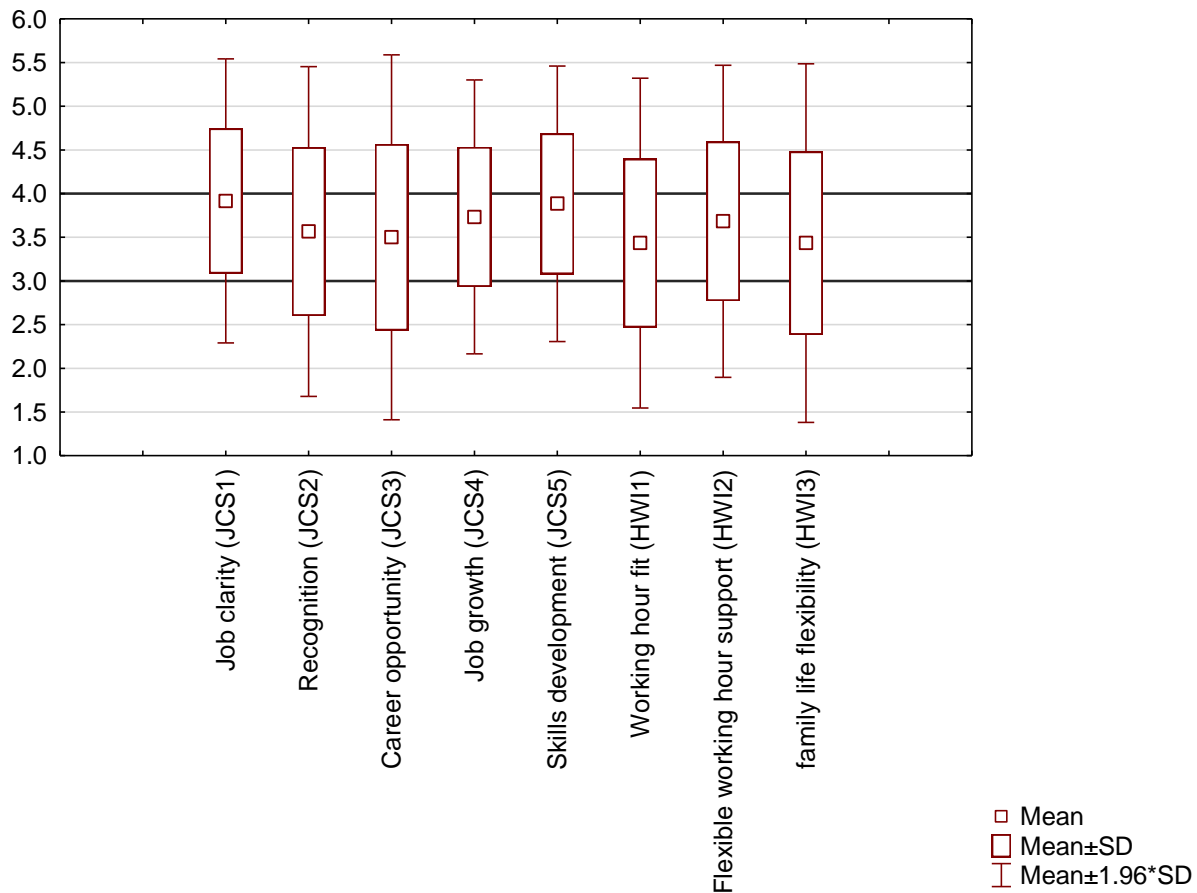
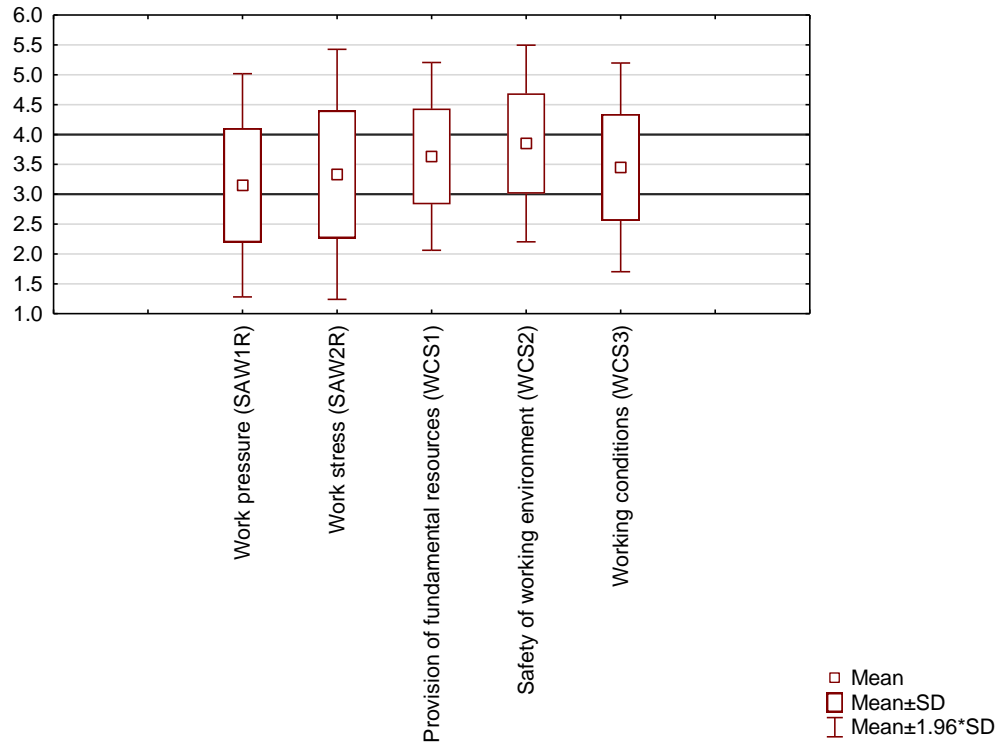


Figure 5. Job/career satisfaction and Home-work interface responses

### Stress at Work and Working Conditions

Stress at work is determined by the extent an individual perceives excessive pressure at work resulting in work place stress (Easton and Van Laar, 2012). Although work pressure (SAW1R) is not statistically significant from ‘3’, work stress (SAW2R) is indeed (Table 3). We therefore accept the hypothesis in that the introduction of the ERP system has a positive effect on stress at work. Comments were mainly positive:

*“Gain time to leave the office and feel stress at the office.”*



**Figure 6. Stress at work and working condition responses**

The working condition theme refers to fundamental resources being made available to individuals (Easton and Van Laar, 2012). All aspects: having a safer working environment (WCS2), the provision of fundamental resources (WCS1) and better working conditions (WCS3) improved and hence the introduction of the ERP system had a positive effect on working conditions. The only negative comments were around wanting more training, better computers and a faster helpdesk response. The WCS questions could be construed as difficult to associate with an ERP implementation, considering the factor relates to basic physical working conditions, security and work hygiene (Easton and Van Laar, 2012). Yet, working environment safety was ranked as the third most improved QRQoL item since the introduction of the ERP. An analysis of the quotes referred to the safety users experienced by having clear roles and work practices which appeared to reduce corruption. Although ERP systems have been reported to discourage corruption in organizations (Bhattacharjee & Shrivastava, 2015), this was an unexpected finding. Clearly the ability of the ERP to reduce corruption was appreciated by the ERP users and contributed to improving their work conditions. This is particularly important as Transparency International (2015) has noted that corruption in sub-Saharan Africa increased in 2015 especially in business.

*“Feel safe to transact”*

*“SAP is a very reliable system and when the time comes for audits, the company that uses SAP is in less trouble than others who don't”*

*“SAP is a structured and secured system and there is no scope for security breach - relieves me from undue pressure”*

*“My customers know the rules and cannot influence me to bypass procedure with release of orders when terms and conditions are not met.”*



### Control at Work and General Well-Being

Control at work reflects the level an employee feels empowered and in control within the work environment (Easton and Van Laar, 2012). Decision inclusion at work (CAW3), the ability to influence work changes (CAW2) and voicing of opinions (CAW1) were perceived to improve the most (Figure 7). Hence, the introduction of the ERP system had a positive effect on control at work. Being able to influence changes impacting the public was perceived to improve the least. These all correlate to the process of decision making which affects the individual, which would be supported by the introduction of the ERP system. The literature reviewed regarding culture indicated that the culture would result in centralized decision making, stifled communication due to ICT and implementation issues, anxiety with process change, and a lower commitment to work. The results however are in contrast to the literature. The findings indicate decentralized decision support was appreciated. However, there were also many negative comments on the extra reliance on the central office and the negatives around centralization and standardization:

*“I have benefited much on my work life since it has made my employer to entrust me with some responsibilities which were not there before”*

*“We lack a little more specific liberty to create in the system”*

*“Could be more effective if the applications of the system would vary in countries in which it is used. The financial environment/legislation differs in each country and the demands also vary”.*

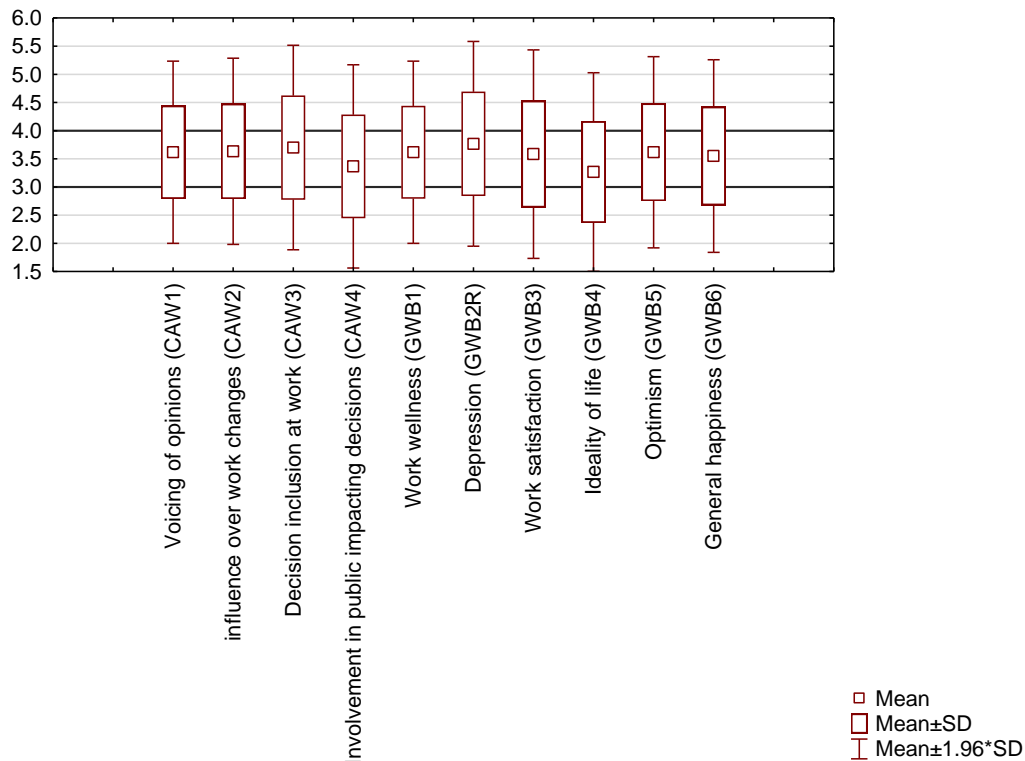


Figure 7. Control at work and general well-being responses

General well-being assesses the extent to which individuals are content with their work life and how the work life is being influenced (Easton and Van Laar, 2012). The perception was that all variables

improve significantly other than GWB4 (Figure 7). Depression (GWB2R), wellness at work (GWB1) and optimism (GWB5) improved the most. These aspects are following by work satisfaction (GWB3) and general happiness (GWB6). Therefore, the introduction of the ERP system had a positive effect on general well-being. GWB is conceptualized as being bi-directionally influenced by work and well-being can influence performance in a positive or negative manner. For example ill health and a reduced sense of psychological well-being could adversely affect work performance (Easton and Van Laar, 2012). It can be argued that the introduction of the ERP has improved work circumstances leading to the well-being of participants. Users also commented on enjoying helping other users:

*“To help colleagues*

*“Work life is easier and pleasant”*

### Influence of National Culture

The influence of demographic variables such as education, length of adoption and location, on the various questions was also analyzed. Education and length of adoption was not found to be significant. However, Table 5, indicates statistically significant differences between participants from mainland SSA and the SSA Indian Ocean islands (22 participants from Mauritius and Reunion). The answers to HI5, GWB1, CAW1, and CAW2 are 95% ( $p < 0.5$ ) statistically different between the 2 groups. The difference is the greatest for communication (HI5), followed by influencing change (CAW2), voicing of opinions (CAW1) and wellness at work (GWB1). All values were perceived to have improved more on the mainland than on the islands. Cultural differences could influence these particular findings as island culture could be significantly different considering the size of the population, education and general requirements. There were insufficient communication comments to understand these differences but the comments on control at work have been discussed and show the reluctance of the island culture to accept the centralization and standardization that came with the ERP implementation.

T-tests; df = 57 Group 1: Islands (I) n = 22; Group 2: Mainland (M) n = 37							
Variable	Mean (I)	Mean (M)	t-value	p	Std.Dev. (I)	Std.Dev. (M)	p (Variances)
HI5	3.55	4.35	-4.13	0.0001	0.91	0.59	0.0199
CAW2	3.32	3.81	-2.23	0.0298	0.84	0.81	0.8364
CAW1	3.32	3.78	-2.15	0.0362	0.89	0.75	0.3482
GWB1	3.32	3.78	-2.15	0.0362	0.84	0.79	0.7159

**Table 5. T-Test Independent Sample by Groups: Africa Mainland and Islands**

### Factors Influencing Overall Quality of Working Life

The change to overall quality of working life with the ERP introduction was measured directly through question OVL1. We then used multiple regression analysis to check which of the items best explained the variance of OVL1. The final regression analysis summarized in Table 6 found JCS5, GWB1 and WCS3 significantly related to OVL1 and using the overall R<sup>2</sup>, explains 70% of the variance. From the derived statistical information, skills development (JCS5), better working conditions (WCS3) and wellness at work (GWB1) is significantly correlated to the overall quality of work life (OVL1).

Regression for Dependent Variable OVL1; R= ,90146479 R <sup>2</sup> = ,81263876 Adjusted R <sup>2</sup> = ,70123478						
N=60	b*	Std.Err. (of b*)	b	Std.Err. (of b)	t(37)	p-value
Intercept			-0,960995	0,526471	-1,82535	0,076029

JCS5	0,423026	0,152568	0,460934	0,166240	2,77269	0,008655
GWB1	-0,280816	0,125193	-0,298268	0,132974	-2,24305	0,030968
WCS3	0,247940	0,110121	0,243893	0,108324	2,25152	0,030378

**Table 6. Regression QWL Scale Variables with OVL1 (Only Significant Variables Shown)**

## Research Synthesis

Prior empirical research has noted the effect of ERP implementations on users in terms of severe job impact and effective response (Seymour and Roode, 2008). The impact on users is highly contextual and mediated by the implementation actions of the project team and the facilitating conditions within the organization. Yet organizations have tended to ignore the impact on users with many case studies referring to inadequate communication, training and support (Ramburn Gopaul, Mwalemba and Seymour, 2016). This research proposed an ERP QWL impact scale which could be used to measure the ERP impact on the work life of users. To our knowledge this is the first attempt to adapt the Dooyeweerd's "Down-To-Earth" aspects and the Easton and Van Laar Work-Related Quality of Life scale and their theoretical underpinnings to an ERP implementation. The first exploratory use of the scale showed that the proposed constructs were reliable but not valid as they failed the factor loadings. The individual questions successfully reflected the significant impact of an ERP introduction on users. The findings confirm that an ERP implementation can impact all 8 elements of the proposed scale namely: human individual, social, job/career satisfaction, general well-being, home-work interface, stress at work, working conditions and control at work.

## CONCLUSIONS AND FURTHER RESEARCH

The main focus of this research was to describe the impact of the introduction of an ERP system on the work life of users in a SSA context. To operationalize this study, the impact of the introduction of the ERP system on users was determined using a proposed ERP QWL impact scale. The research was conducted with users in SSA countries where an ERP had been implemented in the prior four years. The data analysis revealed some unexpected findings. Analysis indicated a positive effect of the introduction of the ERP systems on all 8 aspects of QWL proposed in the initial framework. Regression analysis showed key predictors of overall QWL to be skills development and essential working conditions to perform daily operations.

The factors that improved the most in decreasing order of improvement were decision making, communication, ICT culture alignment, job career satisfaction and working conditions, while stress at work was found to be the least improved. The improvement in working conditions seems to be attributed to the improvement in controls and hence reduction in corruption. Statistical differences were found between users from mainland Africa and the Indian Ocean islands with the island culture appearing less accepting of the centralization and standardization approach with ERP implementations. The findings will ideally focus attention on user aspects which organizations should be mindful of when implementing ERP systems. In terms of research limitations, this study was done in one organization and it can be assumed that varying impacts of ERP systems will be found in different organizations in SSA countries. This could be attributed to subjective influences such as past experience using ERPs, organizational culture which either negatively or positively influences organisational outcomes, as well as organizational practices such as change management.

In terms of the implications to theory and practice, extant ERP implementation research studies have not considered the impact of ERP implementations on users. This study proposed a theoretical framework

from Dooyeweerd's DTE aspects and the Easton and Van Laar WRQoL factors and adapted existing survey instruments to ERP implementations. Therefore this study is an important first step from a theoretical and practical perspective in developing an ERP QWL impact instrument which can be used by organisations and developed further by future researchers.

In terms of future research recommendations, the open questions answered by users point the way to improve the instrument to be more aligned with an ERP implementation. In addition, future research could assess national and organizational culture affected by other significant technology endeavours in SSA. Future research could additionally measure the organizational culture in facilitating business outcomes especially in guiding an organization through change. The differing views between mainland SSA and the SSA Indian Ocean islands should also be considered. In line with Walsham's (2012) urging that IS research should focus on improving the world in which we live, we urge practitioners to use the instrument to measure the impact of ERP implementations on users and hence consider more carefully how organizations can improve the impact.

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## APPENDIX 1

H1R with SOC1 (79%)
HI2 with SOC3 (69%), JCS1 (67%) GWB4 (64%).
GWB1 with HI4 (62%), HI5 (66%) technology facilitated wellness
SOC3 with GWB5 (63%), WCS1 (61%) organisational culture
SOC5 with JCS1 (68%), JCS4 (63%), GWB1 (60%), WCS1 (60%).
SOC6 with WCS1 (60%) organisational culture
JCS1 with HWI1 (61%) individual circumstances
JCS2 with GWB3 (63%)
JCS3 with WCS1 (67%) confirms strong relationship between variables as indicated by Easton and Van Laar (2012)
JCS4 with CAW3 (66%), HWI2 (67%), WCS1 (71%), OVL1 (64%)
JCS5 with CAW3 (70%) HWI2 (61%), OVL1 (68%)
GWB1 with WCS1 (65%) wellness at work
GWB5 with WCS1 (67%) general well-being

**Table A1. Pearson's Product Moment and Correlation Coefficient Results**