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Optimizing Study-life Balance within Higher Education: A Comprehensive Literature Review*

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Abstract

Purpose: The rise of the phrase Work Life Balance was bought up in 1986 when amid many Americans there was prevalence of detrimental work place practices like neglecting families, leisure activities and friends in order to achieve their study place goals. The significance of work-life balance has been gaining ground in recent years to grasp a wider range of groups, including students. Searching and finding a balance can be complex and challenging for many individuals and students. **Research design, data and methodology:** Through this paper we will explore how students balance the competing demands of work, study, and social activities. Several factors have increased imbalances within Educational organizations, and technology specifically has been influential. However, technology also provides a novel solution to this organizational performance management issue. A Study-Life Optimization model (SLO) is suggested, which incorporates information systems, analytics, and decision support into a Smart Service System. A general framework for this model, detailing data collection, measurement, and ethical issues is explained briefly. **Results:** Outcomes include improved WLB, greater perceived quality of life, and increased Educational organizational performance. **Conclusions:** This paper contributes to the relevant literature as it pays attention to the various students' of varying lifestyles school-work-personal lives. Findings of this study will provide a meaningful of the Work/school-life balance issues faced by students. The research could be helpful to the various stakeholders of a University, the curriculum designers, program coordinators etc.

Keywords : Study-life Optimization, Big Data, Analytics, Higher Education

JEL Classification Code : M1

1. Introduction and literature review

For efficient functioning of one's life, it is essential to acquire optimum balance between the different roles one plays on a daily basis. A student has a variety of roles: a partner, worker, friend, classmate, etc. The Work Foundation has defined WLB as:

“Work-life balance is about people having a measure of control over when, where and how they work. It is achieved

when an individual's right to a fulfilled life inside and outside paid work is accepted and respected as the norm, to the mutual benefit of the individual, business and society.” A large concentration of energy only on academics can affect personal relationships. Similarly, over indulgence in relationships at the expense of one's academics or work can be counterproductive for student's overall performance, which again impacts the individual and his various relationships. Hence it is crucial to strike optimum college and life balance. Work-life balance thus refers to, "The extent

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to which individuals are equally involved in-and equally satisfied with-their work role and their family / personal role (Greenhouse & Allen, 2011]. College-life balance is important for optimal academic functioning. Students often prioritize academics at the detrimental cost of personal factors, including relationships and exercise. This can lead to a decrease in academic performance, as overall health and well-being are critical to optimal academic functioning. The quality of student's relationships can determine the health of student's school/life balance. A large focus on school work can cause anguish in personal relationships, minimizing students sense of support. Similarly, a focus of attention with relationship issues at the expense of academics or work issues can be detrimental to performance, which can put further pain on the individual and the relationship. Finding ways to integrate school and personal life is vital

2. Study-life optimization: Theoretical background

Focus to issues of work-life balance has been primarily prompted by demographic changes in the workforce (Beauregard & Henry, 2009; Brus, 2006; Kamenou, 2008). To date, research on work-life balance has been conducted in various contexts including, but not limited to, the medical field (Keeton, Fenner, Johnson, & Hayward, 2007), construction industry (Watts, 2009), and corporate America (Hobson, Delunas, & Kesic, 2001). Moreover, and related to this research, work-life balance has been investigated in higher education (Bardoel, De Cieri, & Santos, 2008; Brus, 2006; Byron, 2005; Marshall et al., 2012; Moyer et al., 1999; Rosser, 2004; Sallee, 2008; Stimpson & Filer, 2011). In education, work-life has become a topic of import, so much that "over the past decade, work-family balance policies have become a popular [faculty] recruitment tool for research universities" (Sallee, 2008, p. 81). However, although work-life balance has materialized as a topic of study and stimulus for policy initiatives in higher education, few studies have considered student work-lives.

The constant battle to balance work and life are sources of stress/pressure for students (Brus, 2006; Mason, Goulden, & Frasch, 2009; Offstein et al., 2004). Consequently, in addition to compelling students to drop out, the intersection of work and life has pushed students to change their professorial aspirations (Mason et al., 2009). Decisions surrounding their personal life have also been influenced by the study journey (Mason et al., 2009). For example, doctoral students often decide to postpone having children (Mason et al., 2009). Although work-life balance is a widely researched field (Byron, 2005), minimal studies have explored the experiences of students (Stimpson & Filer, 2011). While taking this into account the struggle that students often experience in balancing their academic and personal lives

(Brus, 2006).

2.1. Impact of study-life balance on optimization

Those who have a better control of balance in their lives will have more positive overall work-life balance, subjective wellbeing, and work/ non-work life satisfaction (Grawitch, Maloney, Barber, and Mooshegian, 2013, p. 281; Gropel, Kuhl, 2009, p. 369). Achieving one's life balance can come from their own techniques, or programs offered by their employers. Studies have shown that even when employees do not use the work-life balance services, simply being offered to them and knowing they are available helps to increase one's work-life balance (e.g., Zheng et al. 2015, p. 369, 372).

College students who deal with high stress often say they wish they had more time; but maybe time is not the answer. Maybe, what students in college need is to learn to balance their multiple demands. Those who feel they have enough time to sufficiently complete their work, goals and self-care are often the happiest people. Boundaries and self-control are two ways to take on board time management. Duckworth and Seligman (2006) define self-control as the ability to suppress prepotent responses in the service of a higher goal' (p. 199; as cited in Kuhnle, Hofer, & Kilian, 2010, p. 252). Self-control is required to uphold and maintain boundaries. Conversely, Bulger, Matthews and Hoffman (2007) found that although boundaries are essential to be made and implemented for a well-rounded life style, they also need to be flexible (p. 365).

These two ideas coincide because traditional values, of school and work, are not diminishing. Though emotional and physical health care are two values that are starting to become just as vital as school and work, leaving less time and resources to be focused on any one value (Kuhnle, Hofer, & Kilian, 2010). Meaning that those who are happier or wish to be happier with their lives should develop enough self-control to uphold the boundaries they make, yet be flexible enough to make the appropriate changes to their schedule or lifestyle when needed.

College students were found to give attention and work around the most important goal or value at the present time. Meaning that the students would have to have the self-control to prioritize according to the most demanding goal or value at the time and focus on it until they could move on to the next one (Kuhnle, Hofer, & Kilian, 2010, p. 254). Similarly, it was found in a study that those who had higher work enhancement were those who had flexible work and personal schedules (Bulger, Matthews, & Hoffman, 2007, p. 371). Work enhancement is defined as when one's job improves their mood in their personal life (Bulger, Matthews, & Hoffman, 2007, p. 369). Although previous studies have looked into values, boundaries, goals, and flexibility, within

current knowledge no published study has explored the school work life balance of college students.

Besides their roles at work, individuals are also sons and daughters, siblings, friends, members of social organizations, and eventually spouses/partners and then parents, with the relative importance of these work- and nonwork roles changing and varying in importance through the life stages (Demerouti *et al.*, 2012). For instance, the importance of social life and hobbies may give way to family responsibilities as a person commits to a life partner and the couple has children. Research recognizes that work and personal life domains can impact one another in positive and negative ways (Carlson *et al.*, 2000, 2006; Grawitch *et al.*, 2010). For instance, individuals experience conflict when aspects of work such as stressful relationships with managers or coworkers or long unpredictable work hours make it difficult to manage family time; or when caring for family reduces efficiency at work. Enrichment results when fulfillment at work (e.g., self-esteem, financial security) and transfer of skills, behaviors, and perspectives at work help a person be a better family member; or when the need to attend to family provides workers with focus and sense of urgency that result in greater efficiency at work. Work–life balance is thus defined as feeling effective and satisfied in both work and personal life domains (Greenhaus and Allen, 2011). Individuals try to minimize or manage conflicts between work and nonwork, and to maximize the benefits that spill over from work to nonwork and vice versa (Kalliath and Brough, 2008). As individuals' roles in the work force and in the family change with time, different aspects of work–life balance take priority.

Traditional college students today belong to the Millennial generation. Millennials, compared with Boomers and Gen-X, tend to place more value on jobs that “leave a lot of time for other things in life” (Twenge *et al.*, 2010). That study was based on surveys of STEM workers taken when they were still attending high school and showed that Millennials' desire for better work–life balance starts long before they consider having children. In part of a worldwide survey of Millennials (National Chamber Foundation, 2012), it was evident that members of this group were willing to work hard but also wanted work–life balance. For residents from Canada and the United States, the top answer to the question “If you could prioritize your life, what would you emphasize?” was “To spend time with my family,” with 56–60% making this choice compared with 35% choosing “To have a successful career.” “To be able to have time to enjoy my hobbies” and “To have many good friends” were selected by <25% of the North American respondents, showing the greater importance of balancing work with family rather than with personal interests.

Family role models are major influences on young people's attitudes toward work (Loughlin and Barling, 2001).

College students who grew up in a family in which both parents shared housework and child care had lower anticipation of work–family conflicts and stronger self-efficacy, that is, belief they could manage both work and family, compared with students who had grown up in traditional households in which their mothers did most of the housework and caring for children (Cinamon, 2006). Because work–life balance is in part dependent on the type of work a person does, a young person's perception of future work–life balance may have some influence on the person's career decisions. Self-efficacy, defined as a person's beliefs concerning his/her ability to perform a task or behavior successfully, influences career choices by determining the types of career exploration that the person will attempt and results in higher levels of persistence when faced with obstacles (Betz, 2004). Inasmuch as a person anticipates lack of future work–life balance as an obstacle to a desired career, having a concept of oneself forging a career while enjoying family life contributes to self-efficacy with respect to work–life balance; and self-efficacy with regard to work–life balance has been shown to actually result in lower levels of conflict between work and nonwork (Fouad *et al.*, 2012). Such self-concept can be developed by exposure to positive role models (Gibson, 2003).

Concept of Work-life balance is not restricted to single country or industry rather it is a prevailing concept in many nations and across all occupations (Akdere, 2006). The author examines (Lee & Koeske, 2004) the concept of worklife balance. Work–life balance has been explained as feeling productive and satisfied in both work and personal life spheres (Greenhaus and Allen, 2011). With exponential rise in competition in almost all spheres of one's life imbalance has become quite common concept in everyone's life. A quality life is shaped both by „aspects of daily life“ and the level of satisfaction derived from these aspects (Camporese, Freguja and Sabbadini 1998). Having an acceptable leisure life is important. Indeed, research has shown that the so-called „personcentred“ attribute of leisure, that is satisfaction with leisure, exhibits the strongest correlations with reported quality of life (Lloyd and Auld 2002). Ziedner, found out that students are more stressed due to their academic workload and work pressures, whereas personal and social factors have less impact on student's stress. Clift and Thomas (1983) observed that there are large amount of course work assignment that are given to the students and that lead to stress. There are many disadvantages associated with work life imbalances among students and it impact student's personal and professional lives. Author (Lazurus, 1998) suggested that factors such as the number of friends, financial satisfaction, perceived discrimination etc. affect the student satisfaction level. Kai-wen suggested that male students feel stronger stress related to family factor in comparison to the females; students who

are in higher grades feel more stress from mental/physical/school and emotional factors. In addition to this, students who take a student loan also feel more stress than those who do not. Suicide among students is increasing nowadays and the major reason behind the suicide is work-life conflict. Engineering and science students also face difficulty in maintaining their personal and social life (Lee et.al. 2001). Psychology students also face study-life imbalance owing to the nature of study and experiments they are required to undertake. It has also been concluded that all such courses which include vocational training leads to stress and study-life imbalance.

Students juggling work in addition to competing obligations from school and home may experience greater challenges in striking a balance. In this case it is even more crucial that students are adept at attending to different roles and setting priorities.

On the other hand, part time students work more and they earn more money in comparison to full time students. Thus, there is lack of balance between study, work and life among students and this leads to stress, bad performance, health problems etc. (Kai-Wen, 2003) Various dimensions of the work/life/study balance were discovered by Gayle and Lowe (2007) for higher education students who were studying at an education college. It was found that a specific set of work/life/study challenges present themselves to these students.

Striking a balance between personal and academic components of students' lives has been identified as helpful for successful degree completion. From review of literature it was found that there has been little to no research that has been conducted on students of higher education on aspiring to acquire good School-Work-Life Balance. In this paper we explore and analyze the balance and issues in school-work-lives. According to Stimpson and Filer (2011), "work-life balance is a topic discussed more frequently in the literature concerning faculty than graduate students in higher education"

Further, most of the studies on students' work life balance has been conducted in western countries (e.g. Warren 2004; Robotham 2001; Clark, Raffe & Lee, J. S., Koeske, G. F., & Sales, E.; Kai-Wen. (2003). Work-life balance amid students is an evolving phenomenon in India, received less focus and has very important implications for the all the stakeholders of universities, vis a vis students, faculty, employees etc. This sets the emerging point of the current research of school-work-life balance amid different streams and types of students.

The objective of the research framework is to identify the factors affecting school-work-personal life balance.

Study-life balance (SLB) is broadly described as a balancing, or dividing time between what you are engaged in at school and what you would like to be doing outside of

school. People conveniently simplify SLB to mean less work and more play, and look at their time sheets to decipher where they can fit in more leisure time without being subject to any negative work consequences. However, as the theories surrounding SLB have been studied and developed, it has become apparent that it's more complex, and that "Balance means that nothing is absolutely static and unchanging – routines cannot be rigid and unchangeable" (Bowling, Eschleman, & Wang, 2010). Life is generally fluid, or ever changing, and so SLB is also ever changing. As our understanding of the complexity of work-life balance begins to increase, the impacts that it has within educational organizations becomes more apparent and susceptible to manipulation. Study-Life optimization is not simply studying less and reducing study related stress, but it may mean for some actually putting a little more effort in at school.

Technology has further heightened the issues of study-life balance in recent years, providing accessibility to students and Education Professionals 24-7, and blurring the lines between study and home responsibilities. For some this may lead to the justification of being less diligent when at work, and for others it may mean not having time to decompress from study related issues. Luckily, technology can also provide a unique and novel solution through utilizing information systems, analytics, and decision support. The wealth of data that is now available through conventional systems and complex mining techniques, coupled with the ability to analyze more complex data in larger quantities, and in real time allows us to go beyond describing and responding to issues. There is a distinct advantage to Educational organizations that are more "predictive" and "prescriptive" in their decision making (Banerjee, Bandyopadhyay, & Acharya, 2013).. The concept of using technology in this way to improve SLB and academic performance is an aspect of what we term Study-Life Optimization (SLO). Computers provide the channel to not only provide meaning from the vast data resources available, but they also provide the means to develop a Smart Service System aimed at SLO. Educational Organizations, equipped with SLO will be able to implement interventions through methods, like increasing awareness and social support, to address issues before they become headaches for Educational organizational management, and decrease organizational performance overall (Halbesleben, 2006; Lyumbomirsky, S. 2008).

Work life-balance is associated most often with employment, but the same principles apply to educational institutions with little translation needed. As the demands of the school environment increase and the available resources do not, or are seen as insufficient, students are more likely to experience burnout, a common sign of work-life imbalance (Salmela-Aro & Upadaya, 2014). Stressors students

experience like academic responsibilities, classmates, and debt have a workplace counterpart. Students report that one of the major forces that interferes with their optimal performance is their work/school-life balance [El-Ghoroury, Galper,, Sawaqdeh,& Bufka, 2012). The impacts of SLB extend beyond the typical educational institution, and therefore the benefits of improving SLB also have wider reach than the traditional definition stated at the beginning of this paper may lead one to believe.

It is appropriate to define work-life conflict in order to better understand what WLB means, the existing conflict driving the need for better balance and optimization. The typical individual has several categorized areas of their lives that place demands on their time and resources, one of those being paid employment for individuals within the workforce. Work-life, or work-family, conflict is typified as a bidirectional inter-role conflict between the different domain areas of an individual's life, and the demands within those areas. It is theorized by Jex & Britt (2014) that the conflicts between these domains can be classified into three major categories: Time -based conflict, strain-based conflict, and behavior based conflict (Jex, & Britt, 2014).].

Time- based conflict is perhaps one of the more objective areas of conflict. The specific behaviors and cognitive processes that occur in the different life domains require time, hours in the day, and these hours are limited no matter how hard the 24 hour limit is pushed. When activities in different domains interfere with the time that can be spent in other domains then conflict ensues. Strain- based conflict occurs when strains in one domain cause issues within another. For example, a parent stays up all night with their small child who has an upset stomach, and the parent gets no sleep. The lack of sleep would be considered a strain on the individual. The next day at work the person has a hard time staying awake and focusing in the afternoon staff meeting. Examples extend beyond sleep and may include mental, emotional, and physical issues. The strain from one area causes issues, or conflict in the other areas. Behavior-based conflict is slightly more complex. The activities and domains of our lives require different roles to be performed by the individual. They may include such titles as coworker, manager, leader, parent, sibling, friend, citizen, etc. A manager may have to enforce strict policies on media use in the workplace, but continuing to perform that role while at the church social later that evening will probably not play out favorably. Switching between the behaviors expected with each role is not easy, and so conflict sometimes follows (Jex, & Britt, 2014). As stated previously, these conflicts are bidirectional, so in which sphere the conflicts manifest themselves differs between individuals. However, conflicts that appear in one sphere often create feedback loops, affecting the other spheres over time. These conflicts affect a wide range of individuals, with estimates ranging from 25 -50 % of

working individuals (Bellavia, & Frone,2005).

WLB is the idea of prioritizing the different domains a person has, and devoting the appropriate time and resources to manage and minimize conflict between the domains (Jex, & Britt, 2014). Within organizations there are several tell-tell signs that work-life imbalances are occurring. Higher turnover, absenteeism, burnout, decreased employee job satisfaction, decreased engagement at work, and decreased performance are some of the ways organizations are impacted the most (Bowling, Eschleman, & Wang, 2010) As previously mentioned, a significant number of employees and employers have reported issues that relate to WLB, and WLB issues have increased over time (CCH Incorporated. 2007). The number of individuals reporting such issues may be increasing due to shifts in the workforce, and what domains of life are considered important or of higher priority to different generations. Why exactly would it be important for an organization to be concerned about work-life balance and optimization? Lowe (2006) points to some of the challenges facing companies in the 21st century (Lowe, 2006).. The workforce is currently aging, creating talent gaps that may slow or even halt company progress. The labor market is also growing increasingly competitive as globalization begins to affect even small businesses. Technology is opening up greater possibilities for when, where, and how we work, and the rising benefit costs puts pressure on organizations to cut any unnecessary funding. Organizations that develop tunnel vision on short term gains and profits may sacrifice employee recruitment, retention, engagement, and finally, long-term productivity. In order to gain an institutional competitive advantage in today's market, companies must invest in their human capital. WLB must be part of that investment, providing a competitive advantage through maintaining employee engagement which will increase retention and talent acquisition, decrease absenteeism, and ultimately drive the productivity and profitability of organizations. In Canada, 600 employers were surveyed concerning common human resource issues, and 36 percent of human capital issues were workload/WLB related, closely followed by 32 percent related to employee stress which is not entirely a separate issue from WLB. However, less than 1/3 of employers did anything to address these primary issues. From 1991-2001 reported dissatisfaction with work-life balance increased by 3.3 percent, from 16.7 to 20 percent. As dissatisfaction increases, commitments to organizations decrease, turnover increases, absenteeism increases, burnout increases, and productivity plummets. One in five employees surveyed reports being dissatisfied with their current WLB, and some of them are seeking changes, or changing companies, in order to address their dissatisfaction. For the sake of further clarifying the degree to which WLB may be an issue, if we were to generalize the findings of these previous studies to the labor force of the United States, approximately 31.4 million

individuals in the US would be dissatisfied with their WLB (April 2015 Labor Force = 157,072,000 people according to the US Bureau of Labor Statistics). 31.4 million Americans could have a higher chance of being less committed to their organization, are more likely to leave a company, are more likely to be absent, burnt out, and be less productive. That is no small number, and anything that could be done to impact that number would have immense benefits for the country and individual corporations. Approx. 10.2% of the entire US population would have an issue with WLB (US population May 2015 = 320,931,00, US Census Bureau). CCH (2007) found that in 1995, approx. 46 percent of reported absences were due to family issues, personal needs, or stress, not personal illness. That is a very large number of absences were accounted for by factors that are connected to WLB, a number that is connected to immense costs for organizations in lost productivity. In 2007, 53 percent of absences reported were for the same reasons. This would suggest that work-life balance issues are increasing over time. Duckworth and Buzzanell (2009) state that this is because work demands are increasing, resources are stagnant or decreasing, and roles and expectations are changing. Work-life -balance is associated most often with employment, but the same principles apply to educational institutions with little translation needed. As the demands of the school environment increase and the available resources do not, or are seen as insufficient, students are more likely to experience burnout, a common sign of work-life imbalance (Salmela-Aro Upadyaya, 2014). Stressors students experience like academic responsibilities, classmates, and debt have a workplace counterpart. Students report that one of the major forces that interferes with their optimal performance is their work/school-life balance (El-Ghoroury, Galper,, Sawaqdeh,& Bufka, 2012).. Though the rest of this paper refers to factors or programs often associated with businesses, the argument is that these same factors and programs apply with minor contextual changes to educational institutions. The impacts of WLB extend beyond the typical workplace, and therefore the benefits of improving WLB also have wider reach than the traditional definition stated at the beginning of this paper may lead one to believe.

3. The SLO Model

The main purposes of WLO programs within an organization are to reduce work-life conflict, decrease turnover, improve company image and ability to attract talent, and improve performance. The understanding of the complex WLB system has improved greatly, along with the connected literature, over the past 15 years. There is still a vast amount of room for improvement, but the relationship between performance and WLB is better characterized now

than ever before. Guest (2002) urges that the following areas of any WLB study should be considered: Determinants, Nature of the Balance, and Consequences/Impact. Under Determinants scientists and practitioners should consider Organizational Factors, including workplace demands and culture, and Individual Factors, including personality, gender, and work orientation. Under Nature of the Balance practitioners should know where the balance emphasis is placed, whether on work or activities outside of work, and what the interaction is between work and exterior to it. Finally, under Consequences/Impact performance, well-being, satisfaction and other impacts should be examined. Already it is clear that operationalizing SLB is more complex than simply surveying student's attitudes, though that is part of the picture. Furthermore, where the balance is situated will vary widely from person to person, requiring that individualized input and experience common to smart systems.

There is a clear kind of flow of the three major areas Guest (2002) posits should be examined. What influences SLB, how is it actually defined from the objective and subjective point perspectives, and what outcomes are we likely to see. Beauregard & Henry (2009) conducted a thorough review of available SLB literature, and propose a path model that maps how some much more specific variables interact with SLB and what some of the specific predicted outcomes are (see Figure 2). These two sources provide a meaningful starting point for developing a stout theoretical model of WLB, and such a model is an integral part of SLO. A theoretical model is not enough however, and technology provides the ability to turn these theoretical models into models of practical predictive and prescriptive use, predictive referring to the ability to identify variables relevant to specific outcomes and prescriptive meaning the ability to prescribe interventions to change those outcomes. This can all be done through the smooth interfaces of smart apps. The process of developing a Smart Services System will require the testing and refining of the described relationships in order to provide a system with practical predictive validity.

4. The Role of Technology in Work-Life Balance

Technology has revolutionized the workplace in many positive ways, but also has begun to "morph the work and personal lives of working professionals into a single whole" (Dash, Anand, & Gangadharan, (2012), p. 52). It has created a means to provide more work flexibility and better WLB. However, it has also come to mean that for many employees the work week never ends. Deciding when, where, and how to be accessible is a major challenge for executives reports Groysberg and Abraham who interviewed about 4,000 executives (2014). Progress in IT, information overload,

need for speedy responses and constant availability, long work hours, and weekend shifts are shown to take a toll on the work-life balance of IT professionals (Goswami, 2014), and an additional weight is put on them to support the technologies being used at all times. Teleworkers, or employees working together in the virtual office, experience a unique amount of flexibility of when and where they work which gives them a unique WLB niche. In an older study by Hill, Miller, Weinter and Colihan (1998) they took advantage of an IBM initiative to transfer workers from traditional offices to teleworker positions. A qualitative analysis revealed that teleworkers reported perceptions of higher morale, greater flexibility, longer work hours, and more productivity, but also reported negative effects on teamwork. A quantitative analysis confirmed findings related to productivity and flexibility. Perceptions of WLB among telecommuters and those still in traditional offices though were mixed, and even negative. "It may be that...virtual office workers have more difficulty separating themselves from work. It may be that teleworkers must find new cues to let them know when it is time to quit" (p. 679). It turns out that in order to better understand the relationship between productivity and WLB, a more complex model of interactions must be developed. For example, Hill et al. recognize that gender and the presence of young children in the family interacted with productivity and WLB. This is where more recent advances in technology may start to provide a clearer benefit. Understanding the situational factors on individuals and entire communities has never been easier. Technology provides a solution to how to manage organizational performance through work-life balance initiatives by providing a method by which WLB models can be better generated, understood, refined, and applied. Companies like Pandora and Mint currently employ information systems, analytics, and decision support to provide services that are individualized for customers, their services (Layton, 2006). Pandora uses a complex algorithm to compare songs on thousands of traits and play songs that match what consumers have already given the thumbs up. The process that they have established a very successful business on is summarized in Figure 1. Mint accesses bank account information, and keeps track of how much money you've made, spent, where you've spent it, and provides financial advice and services that are most pertinent to your habits. Organizations can use this same technology to the benefit of WLB and productivity, providing instead of better music or financial advice, necessary information to inform organizations WLB interventions and programs. One of the major services that these companies have been able to capitalize on are mobile applications, programs that adapt in real time, and provide a unique experience to the individual. These applications resemble and even rival the smart systems of Apple, Google, Microsoft, and other tech. giants.

Likewise, it is feasible to develop such a system that adapts as the schedule, demands, and resources change that Individuals have access to.

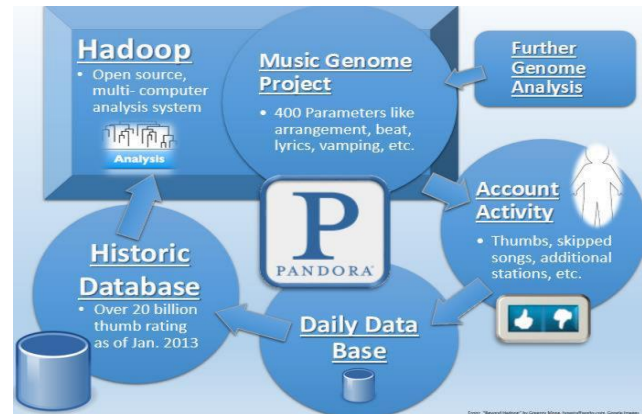


Figure 1: Pandora analytics model

5. Study-life optimization

SLO is designed to take the existing models of SLB and utilize information technology, study analytics, and decision support for the benefit of managing academic performance within educational organizations, and direct SLB programs. Not only are there clear benefits to educational organizations, but individuals will benefit from greater engagement and fulfillment at school and beyond. As the discussion above indicates, the benefits of SLB programs may not be as intuitive or straightforward, and there are many characteristics

these programs should have to make them the most profitable. In order to better understand and influence a complex system there must be a means of analyzing an educational institution's unique variables, and streamlining programs for efficiency and effectiveness. SLO will do just that for each unique Educational organization.

In its conceptualization the WLO project consists of:

1. A theoretical SLB model that is continually developed and revised similar to the analysis variables used by leading stock brokers. This model will be updated as the salience of new variables are identified, and as existing variables lose their predictive validity. This will ensure that the theoretical model is constantly being updated and optimized. Input from users in real time to the smart system will allow updates to be more fluid.
2. The theoretical model will inform database construction and management. There will be a set list of predefined variables that will be included in database construction, and some considerations on data collection will follow hereafter.

3. For each individual Educational organization a needs analysis will be conducted concerning variables such as individual differences and educational culture. This will inform the development of the analytical prescriptive model. A base structure will be used for every educational institution, but the weight of some variables will need to be adapted at onset in order to make sure immediate implementation of the SLO will be successful.

4. Once the database, data collection procedures, and analysis model are in place, the SLO program will begin analyzing Education Institution SLB initiatives, and after some optimization, will be able to provide the institution with prescriptive suggestions of how to improve SLB of the educational institution members.

5. Individuals will have the opportunity to personalize the SLO system as they input their own information such as appointments or events. The system will begin to update and make unique suggestions to the individual to optimize their SLB in real time. Additional optional assessments and tools will be provided to further customize the smart system.

6. The SLO will continue assessing the SLB of individuals within the organization as changes are made and as the organization progresses, and continue to give decision makers the data and information they need to make important decisions to improve academic performance. Thus you get the input from the individual's environment, and that of the organization.

The SLO System meets that core characteristics of Smart Service Systems. The system will be able to update in real time using the advantages of machine learning to provide end users, the individual employee concerned and relevant company management, with an accurate assessment of the WLB for that individual and for the organization on a more macro level. Individuals will be able to see where conflicts may exist between the different domains of their lives, and will receive prompts on what potential conflicts to be aware of and how to improve their current situation. Employees will be able to update their profiles and schedules, and receive immediate feedback on the changes they have made. For example, a user could see how taking a few days off for vacation to the Bahamas without answering emails vs spending 30 minutes each morning and evening to do so would impact their WLB over the next couple of weeks, and then they could decide what is best for their vacation time. As new information becomes available to the system, it will be able to determine what added empirical value the information provides and incorporates it into the model.

The actual deliverables provided by the system will need to take a variety of forms. Various mediums will be utilized to provide real time suggestions and alerts to the appropriate parties such as desktop notifications and messages. Daily notifications can be provided to a select few such as managers and spouses as specified by the company and targeted employee. Weekly stoplight reports will be provided to help provide a breakdown of which areas have seen strain over the last week, and how changes made in the name of optimization have impacted the week's results. On a monthly basis a trend report will be provided with spotlights of key events, and a breakdown of next steps for greater study-life optimization. It will be strongly encouraged that WLO goals and relevant metrics also be included with annual and bi-annual performance review programs. Employees and managers alike will be able to improve their decision making with the additional cognitive assistance. Dashboards will be available for real time data manipulation, corporate analysis, and decision assistance. Optimization is the driving of educational institutional productivity through managing SLB. The vision is to provide cognitive assistance to the individual employees of an organization, and to the concerned leadership. As demands are placed upon organizations to perform in fluid environments the system will be able to provide real-time input that is unique to the situation and the combined contextual variables. Driving company productivity can be done in a socially responsible manner. As changes are made within the organization, those changes that are most effective will serve as a reinforcing feedback loop, and the assistance provided will become more and more accurate and in-tune with the organization's needs. One challenge to the optimization system is that employee's and organizations sometimes appear to be at odds in their desires, and so by optimizing we may alienate both parties to some degree. The purpose of this system will be to provide cognitive assistance and drive positive behavior change that will benefit all parties involved in the long-term. One of the primary arguments of organizational psychology, the science concerned with the study of SLB, is that by improving the lives of the students, you will develop an organization with immense human capital and greater productivity. By investing and making positive social changes within the organization you will be improving work conditions, attracting greater talent, retaining employees, and further increase your human capital and drive productivity.

Optimization is developing an upward SLB spiral within an organization and individual's lives. Optimization is not the pitting of various objectives against each other, but instead strategically aligning objectives like employee satisfaction, compensation packages, and company profits to provide a unique advantage to the organization. Together these pieces come together to turn available data and theory

into a practical tool. As was noted in the first paragraph of the paper, Burton (2004) said that “Balance means that nothing is absolutely static and unchanging – routines cannot be rigid and unchangeable”, and the SLO will be able to address to the fluidity of the organizations’ environment over time.

Educational Organizations will need to front some initial investment, however the costs of maintaining the SLO system will be minimal, and in the future will incorporate other administration issues beyond SLB. The returns from such a system could include increased productivity (some companies reporting as much as a 10% increase from SLB initiatives), increased profits, increased shareholder returns (survey of Fortune 500 companies found a \$60 million dollar gain per WLB initiative announcement per company), less burnout, increased reciprocity from employees, increased organizational commitment, increased return from recruitment efforts, and decreased turnover, as stated several times previously (Beauregard & Henry, 2009). It is important to stress that SLB is part of the fluid life experience, and will experience and ebb and flow. Sometimes less work, or distance from other responsibilities is not always the answer. Part of optimizing SLB is also optimizing productivity and engagement. In the end, organizations will see an increase in their bottom line as SLO is achieved.

Successful achievement of these goals will require the help, expertise, and support from a variety of disciplines, including psychology, sociology, linguistics, marketing, finance, human resources, IT, people analytics, and many others. However, they will all be held together by information systems, analytics and decision support. SLO was conceived to, at the core, try to help people make more thoughtful decisions for their lives based on real data and collaborations through smart systems. As organizational initiatives, and individual initiatives like conflict management training, time management training, counseling services, increased social support inside and outside of work-related activities, emphasis on employee development and work placement, etc. (Marques, 2005) are applied, organizations will be able to measure the benefits of study-life balance. The benefits have been outlined and repeated to make it clear what the return on WLB can be.

One of the key benefits to embarking on a global scaled project like this is that with more data, experience and research the WLO will not only be able to help people with the knowledge and theories that we have today, but it will be able to gather data on these issues in an unprecedented scale and help refine and develop new theories and interventions to make a significant difference in global well-being. This is a project that extends into the long term, several years to decades, as it improves, is invested in, and develops to add a unique application of study- Life Optimization through the

use of smart service systems.

Study-life Optimization will provide a clear link between an organization’s productivity and the WLB of employees, and may be used to create an upward spiral of productivity and satisfaction. Such a Smart Service System is feasible, and could provide meaningful, unique cognitive assistance to students and leadership alike. This system meets the cries for educational social responsibility, and has immense value-added potential.

6. Data Collection

Data is necessary to transform our theoretical model into a functional one, and there are many sources of common data that could be collected in an organization or trans-organizational setting. In some cases this data can be easily collected or is already being collected, but some new sources of data can be utilized with appropriate sensors and permission. WLO is not meant to infringe upon the privacy and personal agency of individuals. The measures that will be available will be contextual dependent, the context being the organization and environment in which people live. Basic demographic information will be essential, specifically including data related to family structure, social support, SES, type of work, workplace characteristics, current work positions, etc. Other areas that would be of particular interest as sources of data are: Communication (every text, email, phone call, etc.), Financial (salary, bank statements, purchasing habits, debt, insurance, etc.), and Life Patterns (Detailed schedule, record of location, entertainment use, fitness and health, etc.). These would take the application of some new technologies and skills to mine the sources well, but the information would be extremely beneficial. HRIS and task management systems may be of particular benefit in providing informative data too for organizations. Also, several measures have been developed already to gain insights into more difficult constructs to measure such as burnout [30, 32]. A combination of several instruments will be used to look at some of the harder to measure constructs. Over time data will become more valuable and diverse. Additionally, the coaching algorithms will improve with time, and more data on each person and people similar to them will be built up and analyzed to make the project even more successful.

7. Ethical considerations

An ethical framework must be established in order to avoid potential issues that may arise via the use of individual data, Big Data, and Analytics. Intended consequences may not always occur, and unintended consequences may create

bigger issues like degrading positive workplace culture, or casting a negative organizational image. There are few authoritative decisions that have been made concerning the ethicality of some data collection methods, types of data that should be collected, and how it should be used for organizational gain. Using uncensored personal data to inform important job decisions could introduce new employment litigations that no company would like to face [28]. Berdichevsky and Neunschwander (1999) lay out an ethical framework for *Persuasive Technologies*, where they set ground rules. Among the most important of the ground rules they outline is what they call the golden rule:

“The creator of a persuasive technology should never seek to persuade a person or persons of something they themselves would not consent to be persuaded to do.” (pp 52)

We propose going one step farther, utilizing SLO to not only build something to persuade them of what they would be willing to be persuaded of, but have the user set the goals or objective of the persuasion. We hope to move beyond the history of most technologies as more incidental, to one that is purposeful, and smart. One purpose of analytics is to step beyond descriptive data, and become more predictive and visionary. As the field continues to progress the lines between what can be done and what should be done are expected to become clearer. It is the prerogative of parties that have that ability to improve the human condition, like improving work-

8. Conclusion

The purpose of this paper is to describe the SLB construct by reviewing several theories, characterizing the possible implications of SLB, and describing SLB models. The impact of technology on SLB, both the good and bad, will be described. Finally a Smart Service System to optimize SLB is proposed, and data collection and ethical practices are explained.

Successful achievement of these goal will require the help, expertise, and support from a variety of disciplines and university departments, including psychology, sociology, linguistics, marketing, finance, human resources, IT, business analytics, and many others. However they will all be held together by information systems, analytics and decision support. SLO was conceived to, as the central focus, try to help people make more thoughtful decisions for their lives based on real data and collaborations through smart systems. As Educational organizational initiatives, and individual initiatives like conflict management training, time management training, counseling services, increased social

support inside and outside of study-related activities, emphasis on student development and study placement, etc. [Marques2005] are applied, organizations will be able to measure the benefits of work-life balance. The benefits have been outlined and repeated to make it clear what the return on WLB can be.

One of the key outcomes to conducting research on a global scaled project like this is that with more data, experience and research the SLO will not only be able to assist people with the knowledge and theories that we have today, but it will be able to gather data on these issues in an unprecedented scale and help refine and develop new theories and interventions to make a significant difference in global well-being. This is a project that extends into the long term, several years to decades, as it improves, is invested in, and develops to add a unique application of SLO through the use of smart service systems.

SLO will provide a clear and transparent link between an Educational organization's productivity and the SLB of students and employees alike, and may be used to create an upward movement of productivity and satisfaction. Such a Smart Service System is feasible, and could provide meaningful, unique cognitive assistance to individuals and leadership alike. This system meets the demands for corporate social responsibility, and has immense value-added potential.

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