Bottom-up influence of Subjective Success (Happiness) on Sri Lankan Grassroots level Inventors

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Abstract
Owing to the poorer explicit successful performances, the grassroots level inventors in developing countries were not given needed attention and acceptable level recognition. Therefore, the question of why these inventors continuously involved in inventive activities where surroundings are becoming hostile to independent inventing remained unanswered in the literature. The present study aims to fill the said knowledge gap by exploring the demographic, psychological, technical and social causes and consequences of objective and subjective success of grassroots level inventors in Sri Lanka. The study was designed as a correlational research. Out of 640 patent applied grassroots level inventors in Sri Lanka between the year 2000 and 2008, 200 were randomly selected as the sample of the study. The sample represented 31% of the target population, and it has provided the acceptable statistical power 0.80 at 0.05 confidence level. According to the bottom-up path model, income, engagement in inventive activities and external linkages have positive influence on the objective success of grassroots level inventors. On the other hand, grassroots level inventors' marital status, internet usage, life orientation and social capital have significant positive influence on the subjective success of inventors. More importantly, selected inventive life inputs: income, engagement in inventive activities and external linkages as well as the outcomes: objective success, inventive career satisfaction and community connectedness have significant indirect and direct positive influences on subjective success respectively.

Key Words: Inventors, Happiness, Success, Grassroots Science, Sri Lanka

Introduction

Inventors are the people who initiate the ideas of all products and processes that make life easier. Modern hallmark inventive community comprises of Ph.D holders who work in research laboratories, multinational companies and research universities. Hence, the independent inventors have rapidly become the grassroots level of the inventive community (Scotchmer, 2004). These grassroots level inventors involved in inventive activities in their garages with limited resources, while industrial, cooperate and academic inventors are working in sophisticated research laboratories with large resource budgets and return on investments. In recent years, innovation systems and technology development have changed in favor of these organizational inventors. However, even with the unfriendly environmental changes, grassroots level inventors are continuously involved in inventive activities while they are not gaining many material benefits from their inventions (IFIA, 2006). Especially, they are the major players in invention systems in developing countries (WIPO, 2009(a)). This behavior raises the question; whether these inventors value their success on some unseen factors, which subjectively drive them than the material outcomes they gain. Even though intuitive knowledge suggests the existence of such relationships, there is hardly any empirical study conducted to explore the causes and consequences of the subjective aspect of success within the grassroots level inventive community.

Background of Sri Lankan Technological Development

Sri Lanka is a multi-ethnic, lower middle-income island nation in South Asia with 20 million mid-year population in year 2009. Sri Lanka has a comparatively higher human development index than the rest of the South Asian countries, but she has fallen behind in technological development compared to neighboring countries in Asia (Dissanayake, 2003).Exports of garments and textiles, worker remittance, tea and tourism have been the major sources of export income and 81 % of imports consist of intermediate and investment imports (Central bank of Sri Lanka, 2008). The import dependency on industrial and technological products of Sri Lanka has been drastically shifted from western countries to Asian countries during the last five years. In year 2008, 73 % of total imports of Sri Lanka originated from India (24%), Singapore (9%), China (8%), Hong Kong (5%) and other Asian and Middle East countries (51%) (Central bank of Sri Lanka, 2008). This growing trend of importing relatively cheap products from Asian countries has reduced the demand for local products and that has negatively affected local inventors attempting to achieve higher commercial success. Owing to the comparative economic advantages of importing cheap technological products from other countries, the Sri Lankan large-scale corporate sector is hardly involved in inventive activities. A lack of corporate inventions is a significant factor that dramatically influences the technological stagnation of Sri Lanka.

Small private companies rather than public-quoted companies forwarded the only limited number of business affiliated patent applications. This scenario has weakened the private sector funding opportunities for large-scale research and development activities, public awareness about the importance of local inventions, and especially the government's intention to provide facilities to improve local innovations. Hence, citizens tend to be addicted to imported products and the demand locally invented products has rapidly weakened. Because of this trend, neither universities nor research institutes have been encouraged to be involved in inventive activities in Sri Lanka. Therefore, the over-cautiousness on the objective economic disadvantages of the inventions has negatively influenced the technological development of the country. Eventually, it has seriously hurt independent inventors who sacrificed their time, money and other resources to invent something new and useful to the world. Therefore, blindly following the universal objective measurements to measure the feasibility of the local inventions has become a serious trap in Sri Lanka, which has increased her technological dependency on other countries and the ignorance of the local independent inventors. Hence, the overall environment in Sri Lanka has not favored the grassroots level inventions.

The technological environment in Sri Lanka is not encouraging for the grassroots level inventors; however, they have not been discouraged. They have been the driving force of the Sri Lankan innovation system. Recent patent statistics show that a significant percentage of independent inventions represent the national patent system in Sri Lanka (Table 01). On average, the independent inventors in Sri Lanka have forwarded 77% of their applications. It has increased up to 80% and 85% in years 2007 and 2008 respectively.

Table 1: Resident Patent Applications in Sri Lanka -2000-2008

Year	Research Institutes	University Affiliated	Business Affiliated	Non-Resident Affiliated	Independent Inventors	Total	% of Independent inventions
2000	5	2	9	1	52	69	75%
2001	7	1	12	1	92	113	81%
2002	11	6	12	1	69	99	70%
2003	13	5	11	1	50	80	62.5
2004	4	6	14	0	82	106	77%
2005	10	6	16	0	113	145	78%
2006	13	12	14	0	121	160	76%
2007	7	7	15	1	123	153	80%
2008	9	6	14	2	170	201	85%
Total	79	51	117	7	872	1126	77%
%	7.0	4.5	10.4	0.6	77%	100.0	

Source: Sri Lanka National Intellectual Property Office

Apart from the significant proportion of independent inventions, grassroots level inventions in Sri Lanka have showed high technical merits as well. Some of the inventions have been recognized as the best inventions in the world. In the 37th International Exhibition of Inventions of Geneva 2009,Sri Lankan independent inventors have won the prestigious World Intellectual Property (WIPO) award and the International Press Award. Sri Lankan invention of "safety kerosene lamp" also won the BBC World Challenge 2009 award as the best invention of the competition. Further, all the best inventor awards of the Sri Lankan annual presidential awards for inventors in 2006 and 2007 have been won by independent inventors. Unfortunately, a majority of the award-winning inventors were unable to achieve high level commercial success for their inventions. Owing to the emerging hostile technological environment in the world, the growth of grassroots level inventions in Sri Lanka is not generally a part of expected behavior. Hence, the controversial growth of the grassroots level inventors in Sri Lanka has raised a question as to why the grassroots level inventors are kept involved in inventive activities in an environment that has rapidly become hostile for their survival and growth.

Unanswered questions relating to grassroots level inventors?

Owing to the poorer explicit successful performances, the grassroots level inventors in developing countries were not given the needed attention and acceptable level recognition. Therefore, the question of why these inventors continuously involved themselves in inventive activities where the surroundings are becoming hostile to independent inventing remained unanswered in literature. The study has four main objectives. The aim of this study is to explore the demographic, psychological, technical and social causes and consequences of objective and subjective success of grassroots level inventors in Sri Lanka.To achieve the aim of the study, the researcher expected to answer how the selected demographic, psychological, technical, social life domain factors can influence the objective and subjective success of grassroots level inventors in Sri Lanka. To answer these questions, the study explores the factors which influences their objective and subjective level success. The study was designed as an explanatory correlational research. Out of 640 patent applied grassroots level inventors in Sri Lanka between the year 2000 and 2008, 200 were randomly selected as the sample of the study. The sample represented 31% of the target population and it has provided the acceptable statistical power 0.80 at 0.05 confidence level.

Understanding the Subjective Aspect of Success

Historically, the success of the inventors has been measured by their objective performances as inventors (Scotchmer, 2004). Inventors have to achieve a large number of patents, patent citations, commercialized inventions and profits to be

considered ‘successful’. However, controversial growth of grassroots level invention in developing countries has questioned the validity of such pure objective success measures. According to Dubina et al. (2011), the objective criteria only represents a stereotyped convention to consider one inventor to be successful over others (Dubina, Carayannis, & Campbell, 2011). Hence, objective criterions do not measure the actual success of an inventor.

Success is defined as an accomplishment of aims or purpose(Oxford University Press, 2010). Almost all human actions and reactions are directed towards success in what they do. Everyone wants to achieve higher success; however, there is no general agreement about what success is and what exactly predicts success (Wrosch & Scheier, 2003). There is especially a large number of arguments over the definition of success, its causes and consequences on human life. Different fields of studies, such as social science, health science, economics, and psychology and community development define the concept of success and its predictors from the perspectives of their particular field. In spite of the multidisciplinary nature of the concept, success has been generally defined as a composite concept that has at least two broad facets. First, the objective success that comprises wealth, physical conditions and physical standard of life. Second, the subjective success that comprises the feeling of happiness and satisfaction with life (Campbell, 1976; Gough, Human Well-being: Bridging the objective and subjective approaches, 2003).

Stanley (1904) wrote a poem called “success” and it begins with, “He has achieved success; that has lived well, laughed often, and loved much…” (Stanley, 1904). If a person is able to live life happily and satisfactorily, he/she eventually achieves success in life. Likewise, in positive psychology literature, happiness and satisfaction with life have been defined as the ultimate aim of living (Conceição & Bandura, 2008; Kenny A. , 2002). Even though, Stanley quoted living well and laughing often as signs of success, in modern positive psychology literature; happiness and satisfaction in life are defined as ‘subjective well-being’ (Snyder & Lopez, 2007).

Jankovic and Dittmar (2006), had found that, even though materialism is growing in the modern world, strong commitment to materialism is detrimental to an individual’s happiness. According to them, if ‘success’ encapsulates only materialistic outcomes, it will be harmful and counter-productive to the happiness of individuals. Hence, the term “success” needs to be encapsulated as an amalgamation of contrasting materialistic outcomes and subjective well-being. Parallel to that, previous literature on measures of success has criticized the measures of success purely based on financial and objective outcomes. It has

suggested the importance of measuring the subjective aspect of success(Gill &Feinstein, 1994; Rogerson, Findlay, Morris, & Coombes, 1989; Diener & Suh, 1997 a). Following this argument, many commentators have described subjective well-being as an indicator of the success of human life (Gough & McGregor, 2007; Diener & Suh, 2003). Hence, in recent socio-economic literature, subjective well-being has been identified as a better social indicator of the quality of life than the traditional objective indicators (White, 2007; Heylighen & Bernheim, 2001). With the emergence of subjective well-being as an indicator of the subjective aspect of success (Heylighen & Bernheim, Measuring global progress through subjective well-being, 2001) and quality of life(Wrosch & Scheier, 2003), it could be utilized to measure the subjective aspect of success of different social groups. Owing to the conceptual agreement of the subjective well-being as the indicator of subjective success, the present study operationally defined subjective success as the persons' own assessment of subjective happiness and satisfaction of life. Therefore, hereafter in this study the term subjective success will be used as a synonymous with the subjective well-being.

Theoretical Rationale of the Study

With the emergence of positive psychology, the importance of understanding positive strengths of the people rather than only negatives/weaknesses has been broadly accepted. In positive psychology, subjective well-being has been recognized as an indicator to measure the subjective aspect of the success of life, which was never measured by the traditional objective measurements. Even though the concept of subjective success is relatively new, there are a number of emerging theoretical arguments in the field of subjective success (Diener E. , 2009 b). Bottom-up theoretical perspective of subjective success is an approach that proposes subjective success as an ultimate goal of life. It suggests that different life domains have positively or negatively influenced the achievement of subjective success of life. As far as the bottom-up tradition had evolved from the Aristotle's pioneering thought of good life, the majority of the initial studies on subjective success have focused on determining this bottom-up relation of subjective success. However, there are recent studies that have investigated the opposing top-down theoretical arguments of the consequences of subjective success. Top down theories have discussed the long-term consequences of being happy and satisfied with life. One of the major top-down theories of subjective success, the Fredrickson's Broaden-and–build theory suggested the importance of studying subjective success as a relatively static trait by discussing how the happy emotions increase social resources, knowledge and skills of people. Further, the emergence of Veenhoven's sociological theory on subjective success indicates that there are personal and social causes as well as consequences of subjective success within society. By considering all the theoretical arguments, Headey et al.

(2005) suggested that a majority of existing studies on subjective success are not comprehensively evaluated taking into account the personal, psychological and social factors which are the predictors (causes) or which personal, psychological and social factors are the consequences of subjective success. Hence, the level of understanding of possible predictors and influences of subjective success is not absolute. However, so far adequate empirical attention has not been given to investigate the validity of these opposing theoretical arguments.

Stated contextual and theoretical knowledge deficiency of behavior of the grassroots level inventors and subjective success, suggest the importance of searching for answers to the under studied problem of why grassroots level inventors are continually engaged in their inventive activities, while they are not achieving much objective success as defined by society. If the inventors are not achieving the objective success of their inventions, inventive life might be a significant life domain that influences the inventors to be happy and satisfied with their lives. Therefore, as other life domains, there might be positive contributions from the factors of inventive life on the subjective success of grassroots level inventors. Otherwise, the inventors' general tendency to be happy and satisfied with life might encourage them involved in inventive life. However, existing studies on grassroots level inventors were unable to explain coexistence of objective and subjective success and their personal, psychological and social causes and consequences of the grassroots level inventors. This limited contextual and theoretical knowledge of the problem have driven the researcher to investigate how the demographic, psychological, technical and social life factors relate to the subjective and objective perspectives of success of grassroots level inventors in Sri Lanka. Therefore, the main purpose of the present study is to explore the demographic, psychological, technical and social causes and consequences of objective and subjective success of grassroots level inventors in Sri Lanka; in order to explain who and why these inventors are continually involved in inventive activities in hostile environments that limit their independent inventing.

Conceptual Framework of the Study

Since Aristotle had described happiness as the ultimate aim of human existence, a majority of theoretical models in subjective well-being/success studies have been designed as bottom-up models that considered subjective success as the ultimate effect that has many causes (Headey, Veenhoven, & Weari, 2005). Diener, Oishi and Lucas (2003) have hypothesized that subjective success is the ultimate effect that people search for and the different life domains and objective success as the causes for it (Diener, Oishi, & Lucas, 2003, p. 420). As discussed in the previous section, a large number of demographic, technical, psychological and social

factors have been tested as exogenous variables in a number of different bottom-up studies on subjective success (Diener E. , 2009 b).

However, there were hardly any comprehensive studies that have measured a large number of factors in a single model (Rogatko, 2010). Therefore, collective effect of the correlates or predictors on the subjective success have not been understood. To understand the real picture of how subjective success functioned among people, a majority of the possible predictor variables need to be included

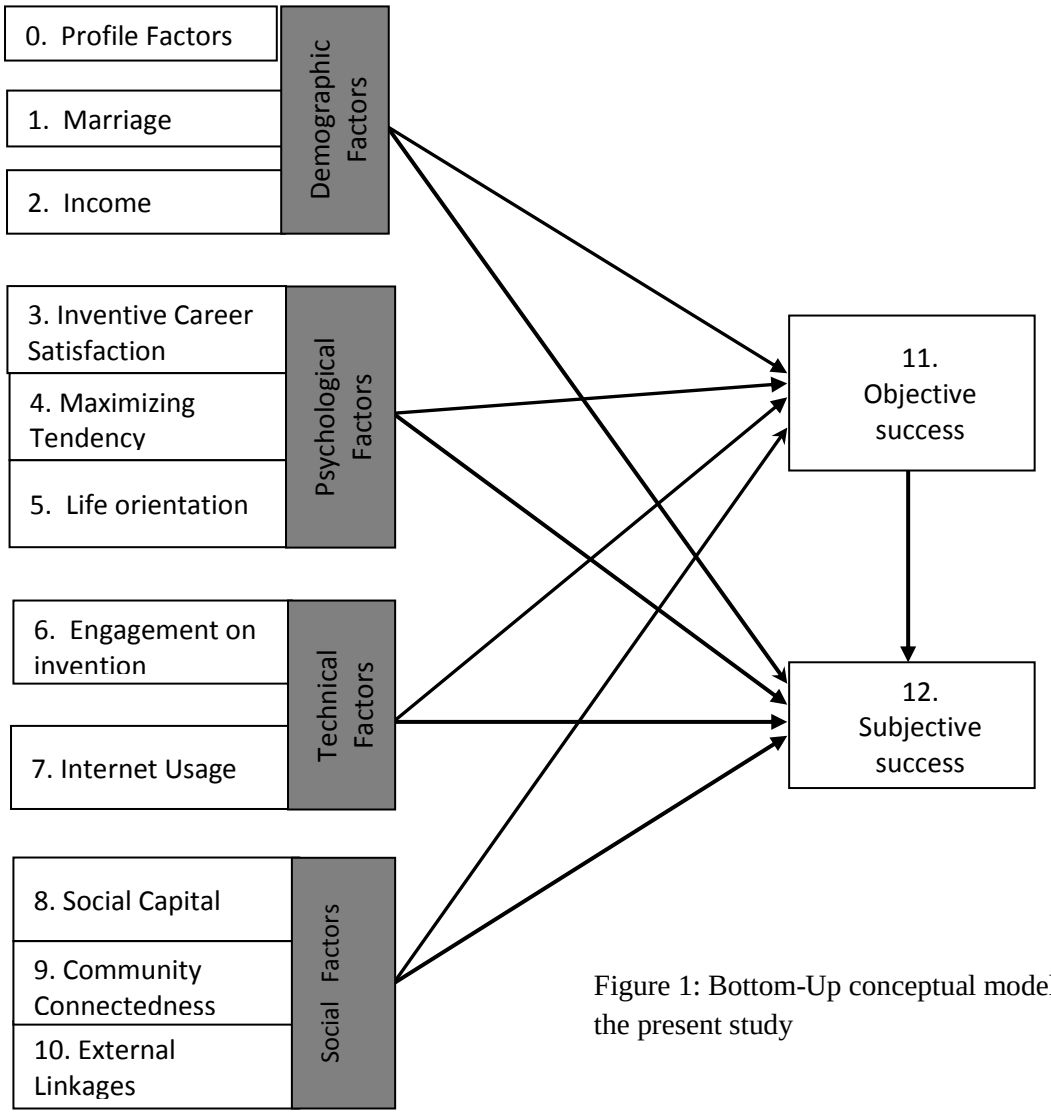


Figure 1: Bottom-Up conceptual model of the present study

within an exploratory sturdy framework. Therefore, based on the theoretical framework, literature on correlates of success and the qualitative pilot study, the

present study has defined the bottom-up conceptual model using selected demographic, technical, psychological and social factors as the exogenous variables, objective success as mediator variable and subjective success as the ultimate endogenous variable (Figure 1).

Operationalization of the Variables

Endogenous Variables

Objective Success:

The present study adopted the Hauschildt's innovation process approach (Hauschildt, 1991) to measure the objective success of the inventors. Objective success defined as the measurable and observable monetary and non-monetary achievements of the innovation process. That includes the patent received, awards and rewards, commercialization, commercial survival and profit earnings. The researcher initially developed the objective success measurement as ten-item likert like scale and asked the selected panel of experts to validate the scale. When the researcher consulted Professor Chinta Weick, she advised the researcher to use a limited number of items with dichotomous response, because it is straightforward to measure and avoid complex comparisons (Weick C, Personal Communication, 12 August 2008). Weick & Eakin (2005) also measured the commercial success of inventors using the multi-item dichotomous (0, 1) scale. Therefore, objective success was measured as the summation of five items measured using dichotomous scale (0, 1) on the patent grants, award and rewards, commercial startup, commercial continuation and profitable inventions. In the questionnaire, the researcher asked the respondents to state how many patents they received, how many inventions have won either awards or rewards, how many inventions started to be commercialized, how many inventions have been commercialized and how many inventions have earned profits at the time of survey. Respondents who reported values 1 or more were considered as one (1) and others a zero (0). By calculating the summation of dichotomous responses, the researcher has generated the continuous objective success variable ranging from zero to five. That is higher than the four scale values, which is the minimum recommended range of scales in structural equation and path modeling (Hair, Black, Babin, & Anderson, 2009).

Subjective Success:

As per the operational definition adapted in the present study, the subjective success is synonymous with the definition of the subjective well-being. According to the literature, definitions of the subjective well-being consist of emotional (mostly measured by the happiness) and cognitive aspects (mostly measured by satisfaction with life). Subjective Happiness Scale (SHS) and Satisfaction with Life Scale (SWLS) are the most administrated scales to measure subjective success (Snyder & Lopez, 2007; Diener E. , Subjective Well being, 2009 a). The

Satisfaction with Life Scale has been tested for its reliability and validity by the authors and a test has shown high level of consistency, validity and reliability to measure the satisfaction of life of different type of domains (Diener, Emmons, Larsen, & Graiffin, 1985; Pavot & Diener, 1993). The Subjective Happiness Scale is also a widely used and validated instrument in 14 different studies with 2,732 participants (University of Pennsylvania, 2007). The results of the study have signified that the Subjective Happiness Scale has a high internal consistency, and validity. In order to measure both emotional and cognitive aspects of subjective success, integration of the Subjective Happiness Scale and Satisfaction with Life Scale was already practiced by the Pichler (2006) and Lyubomirsky (2008). Therefore, Professor Lyubomirsky recommended the researcher to use integrated scale in the present study (Lyubomirsky S, Personal Communication, 21st February 2010). Both the SHS and SWLS are available for free usage with copy left policy. Therefore, in the present study, Subjective success was measured using summation of original Subjective Happiness Scale - 4 items (Lyubomirsky & Lepper, 1997) and Satisfaction with Life Scale – 5 items (Diener, Emmons, Larsen, & Graiffin, 1985). Both these scales have seven pointlikert like responses from (1) strongly disagree to strongly agree (7). Therefore, in principle summated value for subjective success can range from 9 to 63. For univariate and bivariate analytical purposes, summated value of subjective success is sub-divided into three categories: Low (9-27), Medium (28-45) and High (46-63).

Exogenous Variables

1.1 Psychological Factors

Psychological factors are generally defined as the mental and emotional states of a person that influence or determine their behavior. As discussed in the literature review, success is influenced by both mental and emotional factors. Hence, based on the literature, the present study identified three psychological factors; Inventive Career Satisfaction, Maximizing Tendency and Life-Orientation as possible predictors of subjective and objective success of grassroots level inventors.

a. Inventive Career Satisfaction (ICS):

Career satisfaction can be measured by a single item scale, Wanous, Reichers and Hudy (1997) have recommended to use multi items scales when possible (Wanous, Reichers, & Hudy, 1997). Greenhaus, Parasuraman and Warmley (1990) defined career satisfaction as ‘the satisfaction of a worker towards the successful outcomes of his work life’ (Greenhaus, Parasuraman, & Warmley, 1990). They developed a five items scale to measure the career satisfaction of workers covering the satisfaction of achievements, career goals, income, advancement and skill development. Then again the definition of job satisfaction

is determined by the psychological reactions to the characteristics of the job, Macdonald and MacIntyre (1997) developed a ten-item scale (Macdonald & MacIntyre, 1997). owing to the specific focus of the context of the present study, at least five items of Macdonald and MacIntyres' scale had to be removed (item number 1, 6, 7, 8, and 10). The other five items were also needed to be modified to measure career satisfaction of grassroots level inventors. After the modifications, the researcher developed a four item scale to measure career satisfaction; covering satisfaction with achievements, satisfaction with recognition, satisfaction with inventing and willingness to continue inventing activities. Each item was measured using five pointlikert like scale, ranging from 5- highly satisfied/very high to 1- highly dissatisfied/very low. Summated value of the inventive career satisfaction was determined by adding individual scores of the four items. Owing to the suggested scoring method, in principle, an inventor's inventive career satisfaction can obtain any value between 4 (1X 4) and 20 (4X 5). For a multivariate statistical analysis, summated value has been used as metric variable.

b. Maximizing Tendency (MT):

Work of Schwartz et al. (2002) has attracted considerable attention to the maximizing tendency by proposing that individuals differ in their global disposition to maximize versus be satisfied in decision making (Lai, 2010). Maximizing is conceptualized as the tendency for seeking only the best option and not settling anything less (Schwartz, et al., 2002). Hence, the maximizing tendency is the psychological drive of spending resources on aiming to achieve the optimal results rather than being satisfied with less optimal results. Schwartz, et al. (2002) proposed that this difference may represent a general behavioral tendency, and they developed a scale to capture the distinction between decision makers who tend to be "maximizers" and those who tend to be "satisfiers".

Most prior studies have used Schwartz et al. (2002) 13 item maximization tendency scale (Parker, Bruin, & Fischhoff, 2007; Lyenger, Wells, & Schwartz, 2006). However, emerging interest of complex multivariate studies demanded to have a shorter scale that can be administrated within a large number of other variables. Therefore, instrument developers have developed shorter maximization tendency scales based on Schwartz's maximization tendency scale (Diab, Gillespie, & Highhouse, 2008; Lai, 2010; Nenkov, Morrin, Ward, Schwartz, & Hulland, 2008). Among them, Nenkov et al. (2008) tried to refine the original 13-item maximizing tendency scale to nine-item, six-item and three-item scales. Based on the empirical evidence on validity and reliability of the shortened scales, they recommended a six-item scale as the best shorter version for future studies. Owing to this six-item scale, direct items were developed from the original

maximizing tendency scale that had higher academic interest, the present study used the Nenkov et al. (2008) six-item maximization scale to measure maximizing tendency. Each item has seven-option likert like scale from completely agree to completely disagree. As per the scale values, in principle summated value of the maximizing tendency can be ranged from 6 to 42.

c. Life Orientation (LOT)

Scheier and Carver (1985) developed the Life Orientation Test (LOT) to assess individual differences in generalized optimism versus pessimism (Scheier & Carver, Optimism, coping, and health: assessment and implications of generalized outcome expectancies, 1985). The LOT and its successor the LOT-R (Scheier, Carver, & Bridges, 1994) have been used in a number of studies on the behavioral, affective and health consequences. Its shortness makes it ideal for use in studies with many variables like the present study. Compared to LOT, LOT-R is also a short scale consisting of 10 items with only six scoring items (Three items for positive direction and three items for negative direction). They used four items as filler items that have no numerical impact to the summated value. In original LOT-R, respondents were asked to indicate their extent of agreement or disagreement with each of the items using five pointlikert like scale; 0= Strongly Disagree,1= disagree, 2=neutral and 3= agree and 4= Strongly agree. Owing to this scoring, in principle original LOT-R summated value ranges between 0 and 24. However, in the present study LOT-R responses were slightly modified by using the likert scales as 1=Strongly Disagree, 2=Disagree, 3=neutral, 4= Agree and 5= Strongly Agree. Therefore, in principle, the summated value expected to be ranged between 6 and 30.

1.2 Technical Factors

In this study, technical factors are defined as factors that are essential to provide technical resources in the innovation process. The present study selected two technical factors that have potential influence on both the objective and subjective success of inventors.

a. Internet Usage (IU)

In this study, the researcher wanted to measure the grassroots level inventors' internet usage for information, knowledge and communication needs. Therefore, items in shopping motive were considered irrelevant. The researcher modified the WMI scale items to develop a shorter scale by reducing items through combining similar items together. To the extent that surf and research factors measures the general and purposive informational usage of internet, item numbers 4 and 6 of WMI were combined as (you use internet) " to collect information" and items 7 and 9 combined as "to get knowledge". Items 8 and 12 of WMI were combined as "to share information" and items 10 and 11 as "to communicate with others".

Hence, in the present study internet usage scale consisted of four itemlikert anchors as 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4= Agree and 5= Strongly Agree. Therefore, in principle the summated value expected to be ranged between 4 and 20.

b. Engagement in Invention (Daily Inventive Hours)

In the present study, inventors were asked to state the average number of hours(per day) in which they are involved in inventive activities. For multivariate data analysis, the stated number of hours has been taken as the metric variable to measure the engagement in inventions. For univariate explanatory purposes, the stated number of hours spent on inventing activities per day, was categorized into three categories. In principle, the number of hours could range from between zero and any value. Therefore, the upper level of the higher category had to be decided by the researcher. Generally, Sri Lanka has eight-hour working days. Therefore, if the inventor works eight or more hours in inventive activities, it was considered as 'higher engagement' in inventive activities.

1.3 Social Factors

Three types of social domains have been identified as influential social factors of the present study; External Linkages, Social Capital and Community Connectedness.

a. External Linkages

In this study, external linkages are defined as the positive relationship between a grassroots level inventor and the third party (expert personnel, organizations and structures) that influences inventing, patenting and commercializing activities. In innovation literature, the third parties who are involved in the innovation process are known as intermediates. Their assistance has been recognized as an important aspect in the innovation process (Svensson, 2007; Howells, 2006; Hoppe & Ozdenoren, 2005). The survey instrument of Georgia's independent inventors 2007, suggested a list of external resources that an inventor could access during the innovation process (Georgia Tech Enterprise innovation Institute, 2008). They suggested 24 types of external linkages with expert personnel, organizations and entities. However, not all the items were available and applicable in the Sri Lankan context. Therefore, the researcher selected 13 items from the list that can be applicable in the Sri Lankan context. In expert linkages scale of the pilot study the respondents were asked to mark the level of assistance they received from each of the external links at inventing, patenting and commercializing stages of the innovation process using likert like scales as 1=Very Low, 2=Low, 3=Average, 4= High 5= Very High. Then the researcher calculated the average value of each item to take the summated score of the external linkages. However, at the quantitative pilot test, the researcher revealed that respondents could answer

better, when they were asked to assess the overall contribution from the external linkages. Therefore, the researcher modified the External Linkages Scale by asking them to select the overall support they received from the external links using likert like scales as 1=Very Low, 2=Low, 3=Average, 4= High 5= Very High. External Linkages were measured by the summated value of the 13 items of the scale. In principle, summated value could range from 13 to 65.

b. Social Capital

A resource generator scale was developed based on the data collected by a sample of 1007 individuals from a Dutch population in 1999-2000. Original scales had 35 items and factor analysis results reduced the validated scale to a 17 item four dimentional scale (Gaag & Snijders, Proposals for the measurement of Individual Social Capital, 2004). This instrument asks about access to a fixed list of specific social resources, that each represent a vivid, concrete sub-collection of social capital, together covering several domains of life. This instrument can be administered quickly, and results are easily interpretable as the representations of social capital, with more possibilities for use in goal speficity research (Gaag & Snijders, 2003). Even though the original 17-item social capital resource generator scale used acquaintance, friend and family as the response scale, the scoring was a dichotomous "Yes" and "No" scale. Therefore, some authors complained about the high average positive responses of Gaag's resource generator scale (Lannoo, 2009). However, Granovetter's (1973) discussions of strong, weak and absent of social ties had provided a better framework to assess the strength of social capital with higher diversity. Therfore in this study, 17 items of Gaag's individual social capital resource generator scale were translated to the Sinhala language by changing only the currency of the item number 4 to Sri Lankan rupees. However, the reasercher modified the response options of the resources generator scale as 1=No, 2=Official Level, 3= Friend's Friend, 4=Friend, 5= Relative and 6= Family Member. Higher summated scores represent strong social capital and lower summated scores represent weak social capital. In principle, summated score of social capital can range from 17 to 102.

c. Community Connectedness

Even though there are a number of established instruments to measure the sense of community (community connectedness), they are very long instruments (Doolittle & MacDonald, 1978; Davidson & Cotter, Measurement of Sense of community within the sphere of city, 1986). However, Frost and Meyer (2009) have measured the community connectedness of the Lesbian, Gay and Bisexual (LGB) community using a relatively shorter scale. Owing to the LGB community being a community of interest rather than a neighborhood community, the scale was able to adapt to measure the connectedness of the grassroots level inventive community. Frost and Meyer's Community connectedness scale consists of 8-

items that were adapted from a 7-item community cohesion scale used in the Urban Men's Health Study (UMHS). They added one item "You feel a bond with other [men who are gay or bisexual]" taken from Herek & Glunt (1995) community consciousness scale. This scale has shown high validity and Cronbach alpha internal consistent value (Frost & Meyer, 2009). In the present study, Frost and Meyer's community connectedness scale was modified by replacing the specific words related to the LGB community by words related to grassroots level inventive community. Even though the original Frost and Meyer's scale has only four likert like responses (1= Strongly Disagree to 4= Strongly Agree), to increase scale sensitivity, the present study used 7 point likert like scale (1=Strongly Disagree to 7=Strongly Agree). Hence, in principle summated value of community connectedness ranged from 8-56.

Target Population and Sampling Frame of the Study

Based on the operational definition, the population of the study is defined according to the following operational criteria.

1. Inventor should be a Sri Lankan citizen.
2. Inventor must apply for the patent for his/her invention. Inventor should be the applicant of the patent.
3. Patent applicant should be the inventor of the invention that was mentioned in the patent application presented to the Sri Lanka National Intellectual Property Office (SLNIPO).
4. Inventor should not indicate any institutional interest or involvement in the patent application (should not mention institutional name, official designation and official addresses as contact details).

The researcher collected the entire resident patent applicants list for the period between years 2000 and 2008 from the SLNIPO in May 2009. Owing to the mix of grassroots level and institutional investors in the patent applications list, the researcher had to identify the grassroots level inventors manually by analyzing the name of the inventor, name of the patent applicant and addresses of the inventors. According to the analysis of SLNIPO patent registry, from 1 January 2000 to 31 December 2008 there were 872 patent applications forwarded by Sri Lankan grassroots inventors who were named as both inventor and applicant of the patent. However, only 640 inventors have forwarded these 872 patent applications (some of the inventors apply for more than one patent during the period). Therefore, 640 grassroots level inventors were identified as the target population size of the study. Identified independent inventors' patent application numbers, names and postal addresses were entered to a Microsoft Excel 2007 worksheet and sorted in ascending order based on their patent application numbers. This list consisted of

the details of 640 inventors and was considered the sampling frame of the target population. The researcher statistically confirmed that the decided minimum sample size 200 was adequate to get the acceptable results in path analysis as suggested by Hoyle, (1995). After collecting the data using survey methods validity and reliability of the data tested.

Data Analysis and Findings

Correlation Analysis of Variables in Path Model of the Study

In this section, the researcher presents the bivariate analysis of the relationship between variables that are included in the bottom-up model of the study. Marital status was measured as a dichotomous scale variable and in Pearson's correlation analysis, researchers are allowed to use single dichotomous variables along with continuous variables (Meyers, Gamst, & Guarino, 2006, p. 118). In Pearson, product movement correlation matrix, R-value indicates the strength of the relationship (correlation) between two variables and the p-value indicates the statistical significance of the correlation. Guildford (1977) suggested a rule of thumb to interpret the correlation coefficients. According to him, absolute values (+/-) of the correlation coefficients, which range from 0 to .2 indicates negligible relationship, 0.2 to 0.4 indicates low relationship, .4 to.7 indicates moderate relationship, .7 to .9 high relationship and .9 to 1 indicates a very high relationship (Guilford, 1977). Pearson product movement correlation matrix of selected demographic, technical, psychological and social variables in the bottom-up path model is shown in Table 2. It shows that there is a statistically significant relationship between objective success and subjective success at 0.01. The positive relationship indicated that both objective success and subjective success are moving in the same direction. However, the correlation coefficient (r) was .341 and it indicates the low magnitude of the relationship. According to Table 61,other than marital status (X1), all the other variables have shown a statistically significant positive correlation with the subjective success (Y1), even at a more stringent 0.01 alpha level. Only maximizing tendency has shown negligible level relationship, but r-value .195 is in very close approximation to .2. Inventive career satisfaction and community connectedness had a moderate relationship with subjective success (r=.438 and .414 respectively). Therefore, other than marital status, all the other variables in the conceptual model indicate low to moderate level significant positive relationships with subjective success.

Unlike subjective success, marital status indicates statistically significant negligible positive relationships (r = .142) with objective success at a 0.05 level. Along with that, internet usage (r= .161), inventive career satisfaction (r = .188) and social capital (.192) have shown significant but negligible positive correlation with objective success. Meanwhile, maximizing tendency has shown negative relationship with objective success. However, the strength of the relationship was

negligible (r= -.049) and not significant at a 0.05 level. Daily inventive hours (r = .363), external linkages (r = .354), and income (r = .272), have shown the highest strengths of the statistically significant correlations. However, according to the Guilford rule of the thumb, still these values indicate low relationship with objective success. Apart from maximizing tendency (r=-.049), life orientation(r=.089) and community connectedness (r = .129) also have not shown a significant relationship with objective success. Multicollinearity among exogenous variables occur only when the correlation coefficient become higher than .8 (Katz, 2006, p. 69). In the correlation matrix, only marital status and income have moderate (r=.429) relationships among the exogenous variables. All other bivariate relationships between exogenous variables (independent variables) of the suggested conceptual model, indicate either a negligible (r <.2) or low (r <.4) relationship. Therefore, among exogenous variables, there is no threat of multicollinearity and each variable is approximately independent or at least only just marginally correlate with each other.

* * P<0.01 * P<0.05 SD= Standard Deviation N= 200

Table 02: Pearson Product Movement Correlation of Variables in a Conceptual Model

	Mean	**SD**	**Y1**	**Y2**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**	**X10**
Subjective Success	41.10	7.051	1											
Objective Success	2.52	1.490	.341**	1										
Marital Status	.68	.470	.134	.142*	1									
Income	38.26	19.135	.230**	.272**	.429**	1								
Daily Invent Hours	3.80	1.672	.310**	.363**	.128	.215**	1							
Internet Usage	12.85	4.393	.348**	.161*	-.095	.278**	.148*	1						
Inventive career Satisfaction	16.24	2.110	.438**	.188**	.027	.016	.194**	.111	1					
Maximization Tendency	27.49	5.204	.195**	-.049	-.098	-.086	-.059	.155*	.142*	1				
Life Orientation	23.47	3.024	.365**	.089	.015	.098	.114	.222**	.186**	.179*	1			
External Linkages (Log)	1.28	.108	.225**	.354**	-.047	-.019	.025	.157*	.163*	.026	.151*	1		
Social Capital	54.20	9.405	.314**	.192**	.068	.216**	.180*	.303**	.075	.040	.089	.067	1	
Community Connectedness	43.28	6.265	.414**	.129	-.118	.037	.129	.161*	.348**	.125	.244**	.184**	.098	1

Path Analysis of the Conceptual Model

The researcher was interested in exploring how the exogenous variables influence the endogenous factors using the model-trimming approach (Bynrne, 2009). Hence, the initial path model was defined as just an identified recursive saturated model, which had an equal number of free parameters (78) and the data points (78) with a zero degree of freedom. Maximum Likelihood (ML) is the usual default estimation method in most structural equation models ((Ullman & Bentler, 2004; Schumacker & Lomex, 2004; Hair, Black, Babin, & Anderson, 2009; Kline, 2011). Owing to the scale free estimate of the ML method, the researcher was able to use transformed variables within the model with non-transformed variables. As far as the variables in the model satisfied the multivariate normality, outliers' assumptions and minimum sample size requirements, the researcher adapted the maximum likelihood (ML) method to estimate the parameters of the path analysis.

In path analysis, hypothesis of the model check based on the significance and the strength of the standardized regression estimates of the individual paths of the model (Schumacker & Lomex, 2004). Figure 02shows the re-produced initial path model and standardized estimates of the individual paths of the model based on the original AMOS 18 output.

According to the estimated path diagram in Figure 35, Objective success was a significant predictor of the subjective success (β = .13) at 0.05 significant level. However, some of the hypothesized relationships were not significant at 0.05 level. Especially the hypothesized predictors of objective success; Marital Status (β=.03), Internet Usage (β=.00), Inventive career satisfaction (β=.08), Life orientation (β=-.03), Maximizing tendency (β=-.03), social capital (β=.07) and community connectedness (β=.00) have not shown significant regression coefficient at the 0.05 level. However, income (β=.19), daily inventive hours (β=.28) and external linkages (β=.34) were significant at 0.05 levels.

According to the standardized regression estimates, influences of inventive career satisfaction (β =.23) and community connectedness (β=.22) on subjective success were significant at .01 level. The influences of marital status (β=.12), internet usage (β=.15), life orientation (β =.17) and social capital (β=.15) on subjective success were significant at .05 level. However, daily inventive hours (β=.10) and maximizing tendency (β=.10) were significant only at .10 level. Income (β =.03) and external linkages (β=.04) have not shown significant influences even at the .1 level.

Squared multiple correlation coefficient (R^2) estimates the relative amount of variance of the endogenous variable (Y) explained or accounted for, by the exogenous variables (x1, x2, x3…) (Joreskog, 2000). In the initial path model, the squared multiple correlation (R^2) of objective success and subjective success were .306 and .481 respectively. It indicates that exogenous variables in the initial model were able to explain 31% of the variance of objective success and exogenous variables in the model were able to explain 48% of variation of subjective success.

Cohen (1988) suggested Effect size as an indicator of the degree of which the tested phenomenon is present in the population. He suggested the calculation of Effects size (f^2) based on the R^2 as,

$$f^2 = R^2 / [1- R^{2]} \text{ where}$$

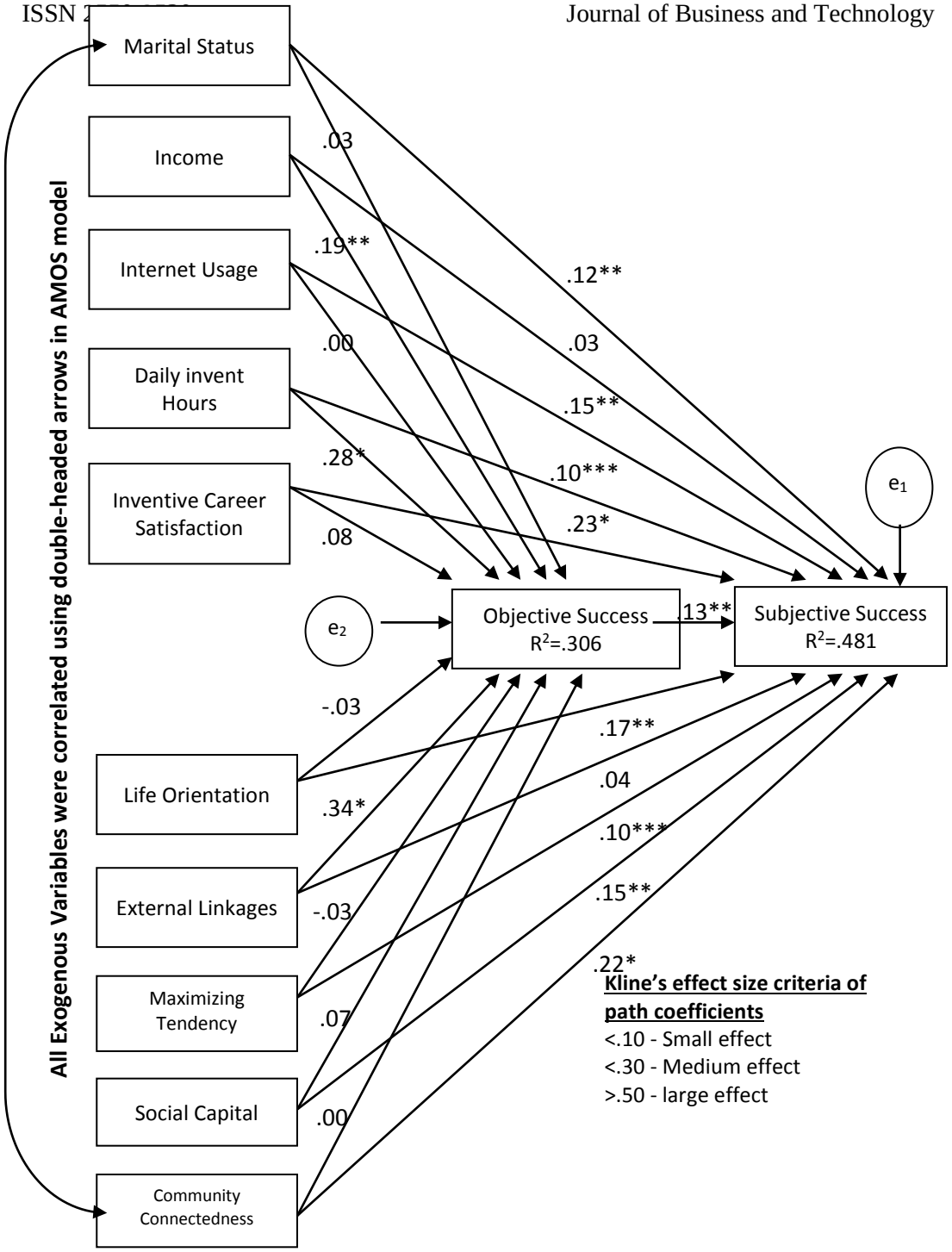
f^2= Effects size
R^2 = Squared Multiple Correlation Coefficient

Hence, the effect size of objective success,

$f^2_{OS} = R^2_{OS} / [1- R^2_{OS}]$
$f^2_{OS} = .306 / [1- .306]$
$= .306 / .694$
$= .440$

In addition, effect size of subjective success,

$f^2_{SS} = R^2_{SS} / [1- R^2_{SS}]$
$f^2_{SS} = .481 / [1-.481]$
$= .481 / .542$
$= .926$



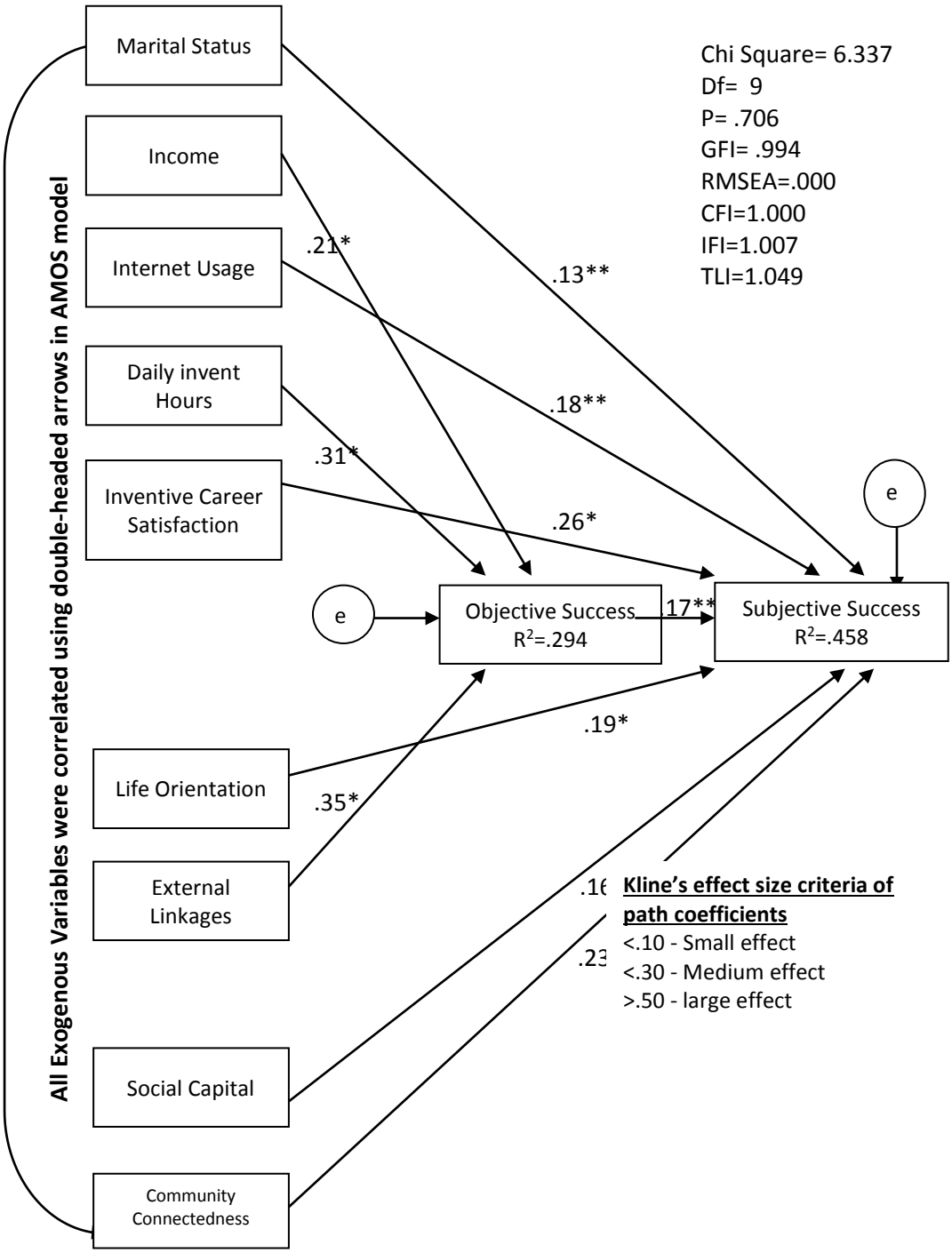
*significant at p<.01 ** significant at p<.05 ***significant at p<.1

Figure 02: Standardized Estimates of Initial Bottom-up Path Model

According to the Cohen (1988) general recommendations on effect size (small= .02, medium =.15 and Large=.35), both objective success and subjective success models have shown large effect sizes (N= 200).
As far as the number of data points of the model equals to free parameters, the model was just identified as a saturated model. As far as in saturated model χ^2 and degree of freedom equals to zero, model fit indices or modification indices were unable to calculate the initial model.

According to the initial model, there were some non-significant relationships between exogenous variables and endogenous variables at .05 level. The researcher modified the path model by eliminating the relationships that were not significant at least at 0.05 levels and re-tested the modified model using ML method. All the paths in the modified path model depicted in Figure 03 were significant at a 0.05 level.

In the modified model marital status (β=.13, p=.013), internet usage (β=.18, p=.002), inventive career satisfaction (β=.26, p=.000), life orientation (β=.19, p=.000), social capital (β=.16, p= .004), community connectedness (β=.23, p=.000), and objective success (β=.17, p=.002) were the significant predictors of subjective success. Meanwhile income (β=.21, p=000), daily inventive hours (β=.31, p=.000) and external linkages (β=.35, p=.000) were significant predictors of objective success at a 0.05 level. According to the Kline (2011) effect size criteria of path coefficients, all the paths in the modified model have shown a small to medium level effect size. Compared to initial model R^2 for objective success decreased slightly to .294 (.306 in initial model) and subjective success decreased to .458 (.481 in initial model). Therefore, effect size of objective success has dropped to .416 and .845 respectively, but still has indicated large effect sizes. In structural equation modeling, the Goodness of Fit Index (GFI) roughly analogous to the multiple R^2 that represents the overall amount of the covariation among the observed variables that can be accounted for by the hypothesized model (Stevens, 2002, p. 431). In the modified model, GFI was .992 and indicated a satisfactory amount of the covariation among the observed variables that can be accounted for by the hypothesized model.



Significant at p<.001 ** significant at .001<p<.05

Figure 03: Standardized Estimates of Modified Bottom-up Path Model

Owing to the reduction of free parameters to be estimated in the modified model, the degree of freedom increased to nine and therefore, χ^2 and other model fit indices were able to be calculated. Hu and Bentler (1999) had introduced the cut of criteria for fit indices of Structural Equation Models (Hu & Bentler, 1999). Table 62shows the major model fit indices and their cutoff values recommended by the Hu and Bentler (1999), Bynrne, (2009) and Kline, (2010) along with the estimated values of the modified model of the present study. The modified model satisfactorily achieved the values over and above the cut-off criteria of all indices. Hoelter's CN (0.05) is higher than 200, shows the adequacy of the sample size. Then again, standardized residual covariance matrix had no values higher than the cutoff value of 2.00 (Bynrne, 2009). The maximum standardized residual covariance value was 1.040. Therefore, the modified bottom-up model of the study satisfactorily fitted the sample data in the variance and covariance matrix.

Table 03: Model Fit indices, Cutoff criteria and Modified bottom up model values

	Index	**Recommended cut off value**	**Value in the model**	**Decision**
Absolute Fit Indices	χ^2(df, N), P	p>0.05	6.3(9, 200)P= .706	Satisfied
	χ^2/df	<3.00	χ^2/df =.704	Satisfied
	GFI	>.90	GFI = .994	Satisfied
	AGFI	>.90	AGFI=.958	Satisfied
	SRMR	<.05	SRMR= .017	Satisfied
	Hoelter's CN (.05)	>200	Hoelter' CN= 532	Satisfied
	AIC	Lower the Better	AIC=120.34	-
Non centrality-based indices	CFI	>.95	CFI=1.00	Satisfied
	RMSEA(LO90, HI90)	<.08	RMSEA= 0.00(.00,.06)	Satisfied
	PCLOSE	>.50	PCLOSE=.908	Satisfied
Relative Fit Indices	IFI	>.90	IFI=1.00	Satisfied
	TLI	>.95	TLI=1.00	Satisfied
	NFI	>.90	NFI= .984	Satisfied

In the modified final model of the present study, income, daily inventive hours and external linkages have an indirect effect on subjective success. In order to detect whether these indirect effects were significantly different from zero, the researcher selected 2000 bootstrap samples and bias-correlated confidence intervals 95 percent using AMOS 18 bootstrapping.

Table 04: Bootstrapping Results of the Mediation Effects-Bottom-up Model

Variable	Standardized Indirect effect	Bootstrapping Estimates			
		S.E.	Lower Bound (2.5%percentile)	Upper Bound (97.5%percentile)	Sig. P (two-tailed)
Income	.036	.016	.013	.078	.001
External Linkages	.059	.023	.023	.118	.001
Daily invent Hours	.052	.021	.019	.103	.001

According to Table 04, the standardized indirect effects of income, external linkages and daily inventive hours are significantly different from zero at .01 level (P =.001, two tailed). Hence, income, external linkages, daily inventive hours have a significant indirect effect on the subjective success. However, none of these variables indicate a significant direct effect on subjective success in the bottom-up path model. Therefore, objective success could possibly be a full mediator variable between income, daily inventive hours, external linkages and subjective success. However, to assume objective success as a full mediator, the researcher had to check whether there is a significant relationship between income, daily inventive hours and external linkages on the subjective success without having the effect mediation variable. When the researcher assumed objective success as not an intervening variable, income (p=.548) and external linkages (EL) (p=.118) have not shown significant direct effect on the Subjective success (Table 5). However, the engagement in invention (EI) has shown significant direct influences on subjective success (p=.024).

Therefore, objective success was a candidate to be a full mediator between the engagement in invention and subjective success. To test the actual nature of the relationship between these variables, the researcher assumed two possible effects: the indirect effect and partial mediation effect. The researcher entered the objective success as intervening variables in both models. In the indirect effect path model, income, external linkages and engagement in invention showed a significant indirect effect on the subjective success (Table 05). In partial mediation model the direct effects of income (p=.855), external linkages (p=.482) and engagement in invention (p=.083) on subjective success were not significant.

Table 05: Boostrap Significance of Full, Partial, No Mediation and Indirect Effects

	No mediation	mediation			Decision
	X→ SS	X→OS	OS→SS	X→SS	
	P	p	p	p	
Income	.548	.001*	.014*	.855	Indirect
EL	.118	.001*	.014*	.482	Indirect
EI	.024*	.001*	.015*	.083	Full mediation
IU	.004*	…	…	.005	
CC	.001*	…	…	.001	
ICS	.001*	…	…	.001	
MS	.037*	…	…	.034	
SC	.008*	…	…	.011	
LO	.005*	…	…	.005	
OS	…	…	…	.018	

*OS=objective Success, SC=Subjective Success, CC=Community Connectedness, MT=Maximizing Tendency, EL=External linkages, LO=Life Orientation, ICS=Inventive Career Satisfaction, EI=Engagement in inventions, IU=Internet Usage, *= sig. at .o5*

As far as without intervening variable engagement in invention had shown significant influence on the subjective success in no mediation model, the objective success was confirmed as a full mediator variable between engagement in invention and the subjective success. However, either income or external linkages have not shown a significant direct influence on the subjective success in both no mediation and partial mediation models. Hence, the income and external linkages have only the indirect effects on subjective success.

Finally, the researcher tested the indirect effect, partial and no mediation models using nested model approach in AMOS. Chi-square difference test indicated that when assuming the partial mediation model to be correct, the chi square difference between no mediation and partial mediation is statistically significant (CMIN=73.165, Df=4, p=.000). However, the chi-square difference between partial mediation and indirect effect models was not significant (CMIN=3.055, Df=3, p=.383).

Discussion and Conclusion

The results of the top-down path analysis indicated that the inventors' achievements of high-level objective success positively influenced them to earn a higher income (β=.20, p<.05), extra engagement in their inventive activities (β=.29, p<.01) and have better external linkages (β=.31, p<.01). According to Arthur, inventors can achieve optimum objective success only by successful

commercialization of their inventions (Arthur, 1991). Therefore, the commercialization naturally increases their income levels, even though they might not achieve net profits. Not only income, commercialization can bring fame and social recognition to the inventors. As Nikola Tesla quoted, inventors feel an unimaginable feeling when they have seen their inventions becoming successful and that thrill encourages them to be more engaged in inventive activities. Past studies on inventors also revealed that inventors' past success has an impact on their present and future inventive activities (Audia & Goncalo, 2007; Davis & Davis, 2007). A majority of the inventors in the present study also commented that when they contacted external entities for financial and other resources to develop their inventions, external parties especially entities such as banks, requested evidence to prove their inventive success (Wickramasinghe, 2010). Therefore, inventors who achieved past success tend to be more accepted by external parties. When combined, the top down influence to the bottom up impact of the income, engagement in inventions and external linkages on objective success, it gives the impression that there is a cycling relationship between income, engagement in inventions, external linkages and objective success. Higher income, engagement in invention and external linkages lead to the achievement of higher objective success and then the higher objective success leads to an increase in income, engagement and external linkages of inventors.

Unlike the statistically insignificant influence of maximizing tendency on the objective success (β=-.03, p=.624), the results of the top-down model indicated a somewhat significant negative influence of objective success on maximizing tendency (β= -.13, p=.075). This indicated that the inventors' objective success achievements have made the inventors to be more realistic and slightly degraded their unrealistic maximizing tendencies. During the panel discussions, immature inventors; those who had not commercialized their inventions tended to be more critical about support from the government, bank loans and public attitude over local products. However, mature inventors who had gone through the troubles of commercializing their inventions were concentrated only on one or two inventions and were attempting to move forward systematically. One inventor who had eight Sri Lankan patents had tried to commercialize seven of his inventions. However, at the time of the survey, he concentrated only on the "high efficient paddy processing system", which has a high market potential in the agricultural industry (Wickramasinghe, 2010). Therefore, the process that leads to the achievement of the objective success has slightly negative effects on the maximizing tendency of inventors. However, owing to comparatively lower effect sizes of both bottom-up and top-down models, in general it can be concluded that a maximizing tendency appeared as a relatively stable trait of the inventors.

Then again, level objective success had only a statistically insignificant negligible negative impact on life-orientation (β=-.040,p=.566). Past studies have shown inconclusive results on the influence of objective success on life orientation. According to literature, life-orientation (optimism) is a relatively stable personality characteristic of a person (Carver, Scheier, & Segerstrom, 2010). Therefore, it is not significantly volatile to the external stimulus. When facing negative outcomes (low objective success), life-orientation just regulates the optimistic person (inventor) to strengthen him with expecting optimistic results in the future (Carver C. S., 2004). Therefore, in most situations life-orientation would not be increased or decreased with external events and outcomes. As such, life-orientation neither can be drastically increased nor decreased by present external outcomes and events.

According to the results, objective success does not have a significant influence on internet usage, career satisfaction, social capital and community connectedness. Even though there is drastic internet infrastructure development going on in Sri Lanka, in general, the internet penetration rate is very low and majority of the citizens have no access to the internet. Therefore, even where inventors needed internet access it has been a difficult and costly project. Even when they do have access, their awareness and usage of internet to gain knowledge and information of their inventive activities has been lower. Therefore, the potential impact of inventors' achievements on internet usage might not be evitable among the grassroots level inventors in Sri Lanka.

In industrial relation literature, performance has been expected to influence job satisfaction. However, grassroots level inventors have challenged themselves to make break-throughs rather than achieve external outcomes (Dahlin, Taylor, & Fichman, 2007). Therefore, they perceived satisfaction with their work rather than in an outcome. The greatest inventor of all time Thomas Edison once quoted that "One might think that the money value of an invention constitutes its reward to the man who loves his work. However, I continue to find my greatest pleasure, and so my reward, in the work that precedes what the world calls success". The insignificant impact of objective success on inventive career satisfaction among grassroots level inventors indicates the universal validity of Edison's explanation of the inventors.

Most of the grassroots innovation promotion movements in developing countries have ignored the patents applied inventors by assuming patent would provide monopolistic rights to the inventors to achieve commercial success that might work against the other members of the community (Wettansinha, Wongtschowski, & Waters-Bayers, 2008). The results of the present study indicate that objective success of the grassroots level inventors in Sri Lanka have no significant impact on the social capital and community connectedness. Therefore, the increase (or decrease) of objective success has not negatively affected the inventors social

capital or his connectedness to the inventive community. This finding suggests that even though the patent applied grassroots level inventors are getting monopolistic rights for commercial exploitation of their inventions, their objective success has not negatively influenced their connectedness towards the inventive community. Hence, the ignorance of patent applied inventors from the innovation promotion movements in developing countries seems to be based on false assumptions, which were based on wrong contextual interpretations. Therefore, the findings of the present study suggest the importance of supporting patent applied grassroots inventors in developing countries such as Sri Lanka.

In conclusion, the findings of the study indicate that only the factors that provide significant physical resources to the innovation process such as income, time and external linkages are getting a significant payback from the objective success. The achievement of objective success slightly makes the inventors more rational and conservative towards what can actually be achieved.

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