Financial Performance Feedback and R&D: A Comparison of Different Models

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ABSTRACT

Purpose: Performance feedback either supports or undermines a firm's current strategy. R&D is one of the most favoured proxies for a firm's response to performance feedback and this relation complements the commonly studied influence of innovation (R&D) on a firm's performance with a backward loop. The performance feedback literature works with a number of models used to empirically test these propositions and this study aims to compare the most common measures and models to locate potentially preferred alternatives for further research.

Methodology/Approach: The research uses panel data with 1,558 observations. The sample consists of 208 US stock exchange listed firms followed over the years 2001-2015.

Findings: The research suggests that models with separate historical and social aspirations may yield a slightly better fit with the data. However, the findings also indicate differences among R&D related dependent measures and their implications for empirical research. These differences arguably also reflect the underlying construct heterogeneity, therefore, researchers should work carefully with them to correctly explain their findings and provide results comparable to the previous literature.

Research Limitation/implication: The limitations of the research rose mainly from the limited number of performance factors studied, which stems from an emphasis on standard financial performance indicators.

Originality/Value of paper: The research contributes to the performance feedback literature by complementing a previous study that compared different aspiration models (Bromiley and Harris, 2014). By focusing on financial performance and R&D variables, the research offers the first concise entry point

for researchers considering empirical studies on financial performance feedback and R&D relationship.

Category: Research paper

Keywords: performance feedback; research and development; firm behaviour; financial performance

1 INTRODUCTION

Innovation is a valuable source of a firm's performance and competitive advantage. Numerous theoretical perspectives describe the relationship, e.g., a dynamic resource-based view (Helfat and Peteraf, 2003), and a number of empirical studies confirms this (e.g., Eberhart, Maxwell and Siddique, 2004; Lome, Heggeseth and Moen, 2016). On the other hand, one can assume that investment in innovation is a function of performance as well. The behavioral theory of the firm (Cyert and March, 1963) expects firms to respond to performance feedback by embracing change, i.e. acting innovatively if performance is unsatisfactory (Simon, 1955). Satisfactory performance means results that attain or exceed a firm's goal – aspiration. These aspirations are formed (Cyert and March, 1963) based on a firm's previous performance, representing historical aspiration, and the performance of a firm's group of peers, representing social aspiration. Attainment discrepancies are then differences between current performance and a given aspiration level. Logically they can be either negative (when a firm underperforms) or nil/positive (when a firm attains or exceeds its aspiration level). Eq. 1 shows this for *attainment historical discrepancy*, while Eq. 2 for *attainment social discrepancy*. The original formulation of aspirations by Cyert and March (1963) also contains a third variable which forms current aspirations – aspiration from a previous period as shown in Eq. 3 for attainment historical discrepancy. However, a previous aspiration is often omitted from the calculation (e.g. Bromiley and Harris, 2014) or has empirically marginal weight (such as 0.04 in the case of Greve, 2003).

$$Attainment\ historical\ discrepancy_{i,t} = Performance_{i,t} - Performance_{i,t-1}, \quad (1)$$

$$Attainment\ social\ discrepancy_{i,t} = Performance_{i,t} - \frac{\sum_{i=1}^{n} Performance_{i,t}}{n}, \quad (2)$$

$$Attainment\ historical\ discrepancy_{i,t} = Performance_{i,t} - \alpha * Aspiration_{i,t-1} - (1-\alpha) * Performance_{i,t-1}. \quad (3)$$

Where $Aspiration_{i,t-1} = \alpha * Aspiration_{i,t-2} + (1-\alpha) * Performance_{i,t-2}$.

Traditionally, empirical studies of performance feedback often use R&D expense or R&D intensity, i.e. R&D expense to sales, as dependent variables (for a review see Shinkle, 2012; or Posen, et al., 2017). R&D expense or R&D intensity can be considered proxies for both a search activity (R&D as a mean of looking for new strategic alternatives) and a result of this search (change in R&D as a decision to refocus the firm's competitive strategy). This combination is theoretically problematic (Posen, et al., 2017), yet it still leads to some interesting findings concering firms' behaviour (Shinkle, 2012; Posen, et al., 2017). Besides R&D, there are studies using performance feedback to explain a firm's behaviour in areas like mergers and acquisitions or divestments (e.g. Iyer and Miller, 2008; Kuusela, Keil and Maula, 2017) or new market entries (e.g. Ref and Shapira, 2017).

Over time, the performance feedback literature has produced an enormous variety of different approaches to the topic, which lead to an abundance of findings in the strength and degree of the relations (Washburn and Bromiley, 2012). Following on from Bromiley and Harris (2014), this study aims to complement and test their findings in the comparison of different aspiration models (aspiration representations), performance and outcome measures. Compared to the original study, this research tests a broader range of aspiration models, especially separate and switching, which Bromiley and Harris (2014) identify as the best fit for their data, as well as it uses different controls. On the other hand, the research has a slightly narrower focus on performance measures – focusing only on the main financial indicators – and on outcome measures with different forms of R&D expense, therefore empirically supporting Bromiley, Rau and Zhang's (2017) proposition that R&D expense should be perceived differently from R&D intensity.

The research contributes to the theory by complementing Bromiley and Harris's (2014) original findings. By focusing on various financial performance and R&D variables, it represents a summary and an entry point for researchers considering performance feedback research, especially for those who study traditional innovation to performance relationship. The practical value of this research lies in its contribution to the aspiration-/goal-setting literature. A knowledge of these mechanisms can be helpful for competitive intelligence or establishing management incentive systems.

2 METHODOLOGY

Aspiration models/representations. The research use three different models of aspiration formation: (i) the separate model which works with two different aspiration variables, one for historical aspiration and one for social aspiration (this representation is arguably the most prominent in the current performance feedback literature, recently used by e.g. Ref and Shapira, 2017); (ii) the switching model, which uses one aspiration variable, either historical or social depending on a switching rule selecting the higher value of two aspirations, i.e.

assuming that a firm strives to be at least on a social aspiration level when its historical aspiration level is lower than it; (iii) the weighted-average model, which uses one aspiration variable being (in the case of the research) the simple average of historical and social aspirations. Besides these, both separate and switching models take three variants: (a) basic; (b) containing historical aspiration scaled by 5%, which represents striving for better behaviour assumed by some authors (e.g. Bromiley, 1991); (c) having a previous aspiration ruled in as shown in Eq. 3. As stated in the Introduction, the previous studies have usually omitted past aspiration or show that it has only marginal weight, however, for comparison and robustness, the main research model is also recalculated using this approach with a relatively high weight of 30% (using the smaller weight closer to 4% of Greve, 2003, does not make much sense as that would lead to results that are almost identical to the basic models). The study only introduces a weighted-average model in its basic variant because of unfavourable properties leading to unlikely firm behaviour over different aspiration levels (Bromiley and Harris, 2014).

Table 1 – Three Pillars of Performance Feedback

Aspiration models (Aspiration representations)	**Performance measures**	**Outcome measures**
Separate model Two separate measures for historical and social aspirations Variant A: Basic model Variant B: Historical aspiration scaled by +5% Variant C: Aspirations contains 30% of a previous aspiration level Switching model? Contains switching variable determining change in focus from historical to social aspiration and vice versa Variant A: Basic model Variant B: Historical aspiration scaled by +5% Variant C: Aspirations contains 30% of a previous aspiration level Weighted-average model: One aspiration measure - equal-weighted average of historical and social aspiration	Net Income ROA (Return on assets) = EBIT / Total assets ROE (Return on equity) = EBIT / Total equity ROS (Return on sales) = EBIT / Total Sales Profit Margin = Net Income / Total Sales	R&D expense R&D expense change = Year-on-year change in R&D expense R&D intensity = R&D expense / Total Sales R&D intensity change = Year-on-year change in R&D intensity

Dependent variables (outcome measures). The study uses all four traditional outcome measures revolving around Research and Development: (i) R&D

expense; (ii) R&D expense change; (iii) R&D intensity; and (iv) R&D intensity change. Their calculations are described in Tab. 1.

Performance feedback variables (performance measures). Five financial indicators serve as financial measures: (i) net income; (ii) return on assets, ROA; (iii) return on equity, ROE; (iv) return on sales, ROS; and (v) profit margin. Their calculations are described in Tab. 1. These five measures mostly come from Bromiley and Harris (2014) and represent the most widely used performance measures from the behavioral theory of the firm literature which are based on firms' financial accounts.

Control variables. Control variables are identical in all the models included in this research. To account for a firm's size effect and its change, the research includes two measures of sales: (i) the natural logarithm of a particular year's sales and, (ii) the change in sales from the previous year. Sales change, especially, is an important addition compared to controls employed by Bromiley and Harris (2014) as R&D is often tied on a certain level to a firm's sales. Additionally, slack search (Cyert and March, 1963) results from a firm having abundant resources that are used for experimentation, which can result in an increase in R&D expense that is not related to performance feedback. To account for the influence of slack resources, the models contain measures for (iii) available slack and (iv) potential slack. The construction of two measures is similar to the research by Marlin and Geiger (2015), the difference is in grouping the variables into two. Available slack consists of the sum of the current ratio (current assets on current liabilities), a quick ratio (current assets minus inventories on current liabilities) and working capital (current assets minus current liabilities on sales). Potential slack consists of the sum of debt to equity, debt to sales and debt to assets.

2.1 Data

The sample used for the research consists of stock-exchange-listed firms from the industrial sector (GICS code 20) domiciled in the United States followed from 2001 to 2015. The data originates from the Bloomberg database. Numerous firms have been omitted from the sample in certain years or completely because they were not listed/did not exist in the given years or did not reported a sufficient amount of data on R&D or other variables. The final sample is an unbalanced panel of 208 firms with 1,558 yearly observations.

To deal with the extremely outlying observations, both R&D expense change and R&D intensity change are capped at the maximum level of change of 100%, so that that higher changes are reduced to the 100% level. Corresponding R&D expense and R&D intensity observations, i.e. the given firm and given year, are scaled down by the same factor. For example, when a firm changes R&D expense from $10 million in year 1 to $50 million in year 2, it results in a 400% increase that is capped in the data at 100% R&D expense change and $20 million R&D expense, respectively. These transformed data are not used to compute the

following year base value (meaning that the original value of $50 million is used for computing the change in year 3).

The models are computed using fixed effects with robust (HAC) standard errors. The software used for estimation is gretl, version 2017b. Gretl is freeware for econometric data analysis developed mainly by Allin Cottrell from Wake Forest University and Riccardo Lucchetti from Università Politecnica delle Marche.

To compare the models against each other, the research adopts the approach of Bromiley and Harris (2014). This means that the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) of particular models serve as means of comparison. The lower the value for a given criterion, the higher the quality a model has when explaining this dependent variable using the sample data. However, it is important to note that small differences may not be statistically significant.

3 RESULTS

The values of information criteria for models with R&D expense as the outcome measure are reported in Tab. 2. In this case, models with net income as a performance measure clearly prevail in quality in both AIC and BIC. The other four performance measures show similar results to each other. In the case of aspiration representations, the separate models have apparently higher quality for net income, although overall there is no clear pattern giving preference to any of the aspiration representations.

Table 2 – Results of AIC and BIC for Models with R&D Expense as the Outcome Measure (Three Lowest Values Indicated in Bold)

	Outcome measure	Aspiration representation	Net Income	ROA	ROE	ROS	Profit Margin
AIC	R&D expense	Separate, var A	**19,848.4**	20,374.1	20,373.2	20,369.8	20,371.6
	R&D expense	Separate, var B	**19,840.2**	20,374.0	20,373.2	20,369.8	20,371.6
	R&D expense	Separate, var C	**19,799.3**	20,374.1	20,373.2	20,369.6	20,371.8
	R&D expense	Switching, var A	20,329.0	20,370.5	20,368.8	20,370.3	20,368.1
	R&D expense	Switching, var B	20,330.2	20,370.5	20,369.8	20,370.3	20,368.1
	R&D expense	Switching, var C	20,313.8	20,370.5	20,370.3	20,370.6	20,368.1
	R&D expense	Weighted 50	20,315.9	20,370.5	20,370.8	20,370.6	20,368.2
BIC	R&D expense	Separate, var A	**21,004.3**	21,529.9	21,529.1	21,525.7	21,527.4
	R&D expense	Separate, var B	**20,996.0**	21,529.9	21,529.1	21,525.7	21,527.4
	R&D expense	Separate, var C	**20,955.1**	21,530.0	21,529.0	21,525.4	21,527.6
	R&D expense	Switching, var A	21,474.1	21,515.7	21,514.9	21,515.4	21,513.3

	Outcome measure	Aspiration representation	Net Income	ROA	ROE	ROS	Profit Margin
	R&D expense	Switching, var B	21,475.4	21,515.7	21,514.9	21,515.4	21,513.3
	R&D expense	Switching, var C	21,459.0	21,515.7	21,515.4	21,515.7	21,513.3
	R&D expense	Weighted 50	21,461.0	21,515.6	21,515.9	21,515.8	21,513.4

The values of information criteria for models with R&D expense change as the outcome measure are reported in Tab. 3. In this case, net income models are the least preferred of all the aspiration representation variants. The best performance measure for R&D expense change is, for this data set, return on sales. As for aspiration representations, AIC and BIC values do not consistently indicate any preferred variant.

Table 3 – Results of AIC and BIC for Models with R&D Expense Change as the Outcome Measure (Three Lowest Values Indicated in Bold)

	Outcome measure	Aspiration representation	Net Income	ROA	ROE	ROS	Profit Margin
AIC	R&D exp. change	Separate, var A	1,950.9	1,945.0	1,945.5	**1,938.1**	1,945.7
	R&D exp. change	Separate, var B	1,950.8	1,945.1	1,945.5	**1,937.6**	1,945.8
	R&D exp. change	Separate, var C	1,950.6	1,942.1	1,945.5	**1,937.8**	1,948.4
	R&D exp. change	Switching, var A	1,945.8	1,944.3	1,944.4	1,944.0	1,944.9
	R&D exp. change	Switching, var B	1,945.6	1,944.2	1,944.5	1,944.0	1,944.9
	R&D exp. change	Switching, var C	1,945.9	1,942.8	1,942.9	1,938.6	1,944.9
	R&D exp. change	Weighted 50	1,947.1	1,946.2	1,945.9	1,939.1	1,945.2
BIC	R&D exp. change	Separate, var A	3,106.7	3,100.9	3,101.3	3,093.9	3,101.6
	R&D exp. change	Separate, var B	3,106.7	3,100.9	3,101.3	3,093.5	3,101.6
	R&D exp. change	Separate, var C	3,106.5	3,097.9	3,101.4	3,093.6	3,104.3
	R&D exp. change	Switching, var A	3,091.0	3,089.4	3,089.5	3,089.2	3,090.1
	R&D exp. change	Switching, var B	3,090.8	3,089.4	3,089.6	3,089.2	3,090.1
	R&D exp. change	Switching, var C	3,091.1	**3,088.0**	3,088.1	**3,083.7**	3,090.0
	R&D exp. change	Weighted 50	3,092.2	3,091.4	3,091.0	**3,084.2**	3,090.4

The values of information criteria for models with R&D intensity as the outcome measure are reported in Tab. 4. AIC and BIC are the most distinguishable across all outcome measures with profit margin having the best values. The second best performance measure is ROS, with the rest being quite similar. For ROA, ROS and profit margin, separate aspiration representations yields a better fit with the

data. This does not hold for net income and ROE, where AIC and BIC are similar.

Table 4 – Results of AIC and BIC for Models with R&D Intensity as the Outcome Measure (Three Lowest Values Indicated in Bold)

	Outcome measure	Aspiration representation	Net Income	ROA	ROE	ROS	Profit Margin
AIC	R&D intensity	Separate, var A	7,526.2	7,482.9	7,523.5	7,202.2	**7,030.8**
	R&D intensity	Separate, var B	7,526.2	7,483.9	7,523.4	7,187.6	**7,039.0**
	R&D intensity	Separate, var C	7,526.2	7,508.2	7,525.9	7,086.5	**7,051.9**
	R&D intensity	Switching, var A	7,523.0	7,521.6	7,522.9	7,361.0	7,254.9
	R&D intensity	Switching, var B	7,523.0	7,521.6	7,522.9	7,361.0	7,255.3
	R&D intensity	Switching, var C	7,522.9	7,521.5	7,522.9	7,358.8	7,252.3
	R&D intensity	Weighted 50	7,523.0	7,513.1	7,523.0	7,146.7	7,324.9
BIC	R&D intensity	Separate, var A	8,682.1	8,638.7	8,679.3	8,358.0	**8,186.6**
	R&D intensity	Separate, var B	8,682.1	8,639.8	8,679.3	8,343.5	**8,194.8**
	R&D intensity	Separate, var C	8,682.1	8,664.0	8,681.7	8,242.3	**8,207.7**
	R&D intensity	Switching, var A	8,668.1	8,666.8	8,668.1	8,506.2	8,400.1
	R&D intensity	Switching, var B	8,668.1	8,666.8	8,668.1	8,506.2	8,400.5
	R&D intensity	Switching, var C	8,668.1	8,666.7	8,668.0	8,504.0	8,397.5
	R&D intensity	Weighted 50	8,668.1	8,658.2	8,668.1	8,291.8	8,470.0

The values of information criteria for models with R&D intensity change as the outcome measure are reported in Tab. 5. In this case, models with ROA and ROS as performance measures show the lowest value in both AIC and BIC. As for aspiration representations, the weighted-average and switching models seems slightly preferable compared to the separate models.

Table 5 – Results of AIC and BIC for Models with R&D Intensity Change as the Outcome Measure (Three Lowest Values Indicated in Bold)

	Outcome measure	Aspiration representation	Net Income	ROA	ROE	ROS	Profit Margin
AIC	R&D int. change	Separate, var A	4,512.2	4,505.3	4,511.9	4,509.8	4,511.9
	R&D int. change	Separate, var B	4,512.2	4,505.1	4,511.9	4,509.8	4,511.2
	R&D int. change	Separate, var C	4,512.1	4,508.0	4,512.1	4,510.1	4,510.8
	R&D int. change	Switching, var A	4,508.4	4,505.8	4,508.7	**4,504.3**	4,509.0

	Outcome measure	Aspiration representation	Net Income	ROA	ROE	ROS	Profit Margin
	R&D int. change	Switching, var B	4,508.4	4,505.7	4,508.8	**4,504.4**	4,509.0
	R&D int. change	Switching, var C	4,508.4	4,506.2	4,508.5	4,508.9	4,509.0
	R&D int. change	Weighted 50	4,508.3	**4,503.8**	4,508.6	4,508.3	4,508.7
BIC	R&D int. change	Separate, var A	5,668.0	5,661.2	5,667.7	5,665.6	5,667.0
	R&D int. change	Separate, var B	5,668.0	5,661.0	5,667.7	5,665.6	5,667.1
	R&D int. change	Separate, var C	5,668.0	5,663.8	5,668.0	5,665.9	5,666.6
	R&D int. change	Switching, var A	5,653.6	5,650.9	5,653.9	**5,649.5**	5,654.2
	R&D int. change	Switching, var B	5,653.6	5,650.9	5,653.9	**5,649.6**	5,654.2
	R&D int. change	Switching, var C	5,653.6	5,651.3	5,653.6	5,654.1	5,654.2
	R&D int. change	Weighted 50	5,653.1	**5,648.9**	5,653.7	5,653.4	5,653.8

4 DISCUSSION

Before making a comparison with the findings of Bromiley and Harris (2014), it is worth discussing the results in detail and pointing out some interesting patterns. When considering the results of R&D expense as the outcome measure, the dominance of net income compared to the others can be attributed mainly to the fact that it is the only financial measure that is not scaled. On its own, R&D expense should be theoretically considered as the least appropriate fit for the behavioral theory of the firm out of the four outcome measures. Compared to change measures, it is left censored as it cannot turn to negative values. Compared to R&D intensity, it does not control for firm size by itself. Moreover, as large firms ought to have higher R&D budgets than their smaller counterparts, differences resulting from performance feedback empirically play a marginal role compared to the absolute values of R&D expense.

What is interesting for both the change outcome measures is that the differences in the information criteria are quite small across all the models. This might be the result of having similar financial measures; all five performance measures use some kind of profit of the firm. Therefore, a firm responding to performance feedback in the case of ROA underperformance statistically responds to other profit-tied measures as well (as ROA underperformance probably leads to underperformance in ROE, ROS etc.). It might be interesting to compare the results with more distinct performance measures, either generic ones such as stock market returns (Bromiley and Harris, 2014) or more industry or firm specific (audience share, Greve, 1998; game score, Lehman, et al., 2011). Such a comparison could either support or reject research findings from a slightly different perspective.

In the case of R&D intensity, performance measures scaled to sales show the best fit. The most obvious explanation lies in the fact that R&D intensity stands for R&D expense relative to sales – meaning that sales play an important role in setting and changing the intensity. Resulting from the personal interviews conducted by the researcher, it is common practice in the industry to anchor R&D expense to sales. This makes R&D investment highly sensitive to the sales performance of a firm. A similar situation is in the R&D intensity change models (at least for ROS), although in this case, the differences are relatively small. Compared to the findings of Bromiley and Harris (2014) who only studied R&D intensity, this study confirms their preference for separate aspiration models. However, in the case of performance measures, the research points to totally different results. Their models favorize net income which is rather surprising if we take into account that the dependent variable itself is scaled. Although empirically plausible because of their use of fixed effect models, which rule out interfirm variance (Certo, Withers and Semadeni, 2017), such result has certain real life drawbacks. A change in net income can be the result of numerous factors other than a change in performance, e.g. acquisitions or divestitures of anything from a single product up to a business unit or a division. Although such activities may and probably will result in a change in R&D expense, it is hard to consider them to be the sole reason for a change in R&D intensity. However, one can still not rule out other behavioural factors such as investors considering net income as an important financial measure worth a year-on-year or industry comparison (despite all its drawbacks and possibilities for masking accounting based performance or even its manipulation, Gunny, 2010) and managers responding to their worries. Nevertheless, in the case of this study, net income has apparently shown the least appropriate fit across all the models for R&D intensity.

It is not surprising that the variants A, B and C from both the separate and switching aspirations have similar results. For example, increasing aspiration by a factor of 1.05 (as in Bromiley, 1991) from the previous year's performance leads to a 2-6% decrease in the overall success rate in attaining aspirations in the study's sample. Similarly, firms have relatively stable financial performance which makes previous aspiration an unimportant factor. Although in some cases deviations from the basic model play a certain role in the resulting AIC and BIC, the values are mostly very much the same. This means that other factors are more important than this aspiration.

The differences in the resulting quality of separate vs switching/weighted-average models can be partially explained by the fact that separate models contain two aspiration related variables (i.e. separate historical and social attainment discrepancies) compared to one in the cases of switching and weighted-average models. Although both information criteria discriminate the higher number of independent variables, the approach is general and by its nature cannot filter any detail. Nevertheless, for this research, this is not considered to be a particularly limiting factor, especially as for some outcome

measures, the separate models show lower values of information criteria, while a few others have higher values.

Although the research suggests some preference for models, it also indicates that there is no silver bullet to solve all the questions. The dependent variable in performance feedback equations plays a crucial role in determining which models are preferable. This study is limited by the sheer number of such variables (Posen, et al., 2017), however its value lies in pointing to particular properties of the individual pillars of performance feedback. Even related variables like R&D expense and R&D intensity measure slightly different constructs (Bromiley, Rau and Zhang, 2017) which lead to a different level of support for particular measures of performance feedback. Also, as differences with Bromiley and Harris's (2014) study highlight, the findings are also sample dependent. Although the cumulative evidence supports some of the findings, more replicative research is needed.

5 CONCLUSION

Over the last three decades, a huge variety of different measures and models for a firm's aspiration has amassed in the empirical research into performance feedback. This variety brings both advantages regarding the findings and disadvantages in the limited comparability of the results. In addition, the sheer number of alternatives makes it difficult to make the appropriate choices. All this leads to the need for research comparing a higher number of these alternatives. This research aims to compare performance feedback models focused on R&D outcome measures and financial performance. The findings support the previous preference for separate aspiration models, nevertheless, it primarily points to differences in alternative dependent R&D variables which make a general recommendation for specific measures and model combinations impossible. Future researchers should take these findings into consideration and reflect upon them when preparing contributions which will be comparable across the literature.

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Evaluation of Chinese E-Commerce Cost and Lead Time Performance to Estonia

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ABSTRACT

Purpose: Retail sales growth has been sluggish in the recent decade in North European countries. Number of factors have caused this, like problems in macro-economy, sanctions and the effect of ageing population. Also increasing amount of e-commerce from China has taken its share. Future development paths need to be researched further to identify the outlook of North European retail.

Methodology/Approach: Four different imported items were examined, which were hypothetically planned to be brought on Estonian consumer markets from China. We take into account freight costs, custom duties, VAT and profit margin requirement. Also lead time performance is being examined.

Findings: Analysis shows that company based imports is not that viable model as profit margin requirement as well as governmental costs (duty and VAT) take lion share from overall costs. Even if profit requirement of company importing the products would decrease, wage inflation in Asia and freight will probably lead to higher product prices. Therefore, e-commerce needs to enlarge to lower cost manufacturing locations and/or use more direct sales to consumers. Total lead time soughts new solutions too (e.g. railway connection to Europe).

Research Limitation/implication: Examination is limited to small Estonian market, and their custom tariffs and VAT. Also logistics costs to Northern Europe are higher than to Central Europe.

Originality/Value of paper: Research is one of the first based on the examination of products and overall costs. It adds value through understanding of import cost structures.

Category: Research paper

Keywords: e-commerce; business-to-business; business-to-consumers; total costs; lead time; transportation

1 INTRODUCTION

Development of e-commerce has been stormy in recent years globally, and especially in China. Online shopping is one of the most popular online activities, but the usage varies by region - in 2016, e.g. it was estimated that 19 percent of all retail sales in China were completed via internet. In 2016, e-retail sales accounted for 8.7 percent of all retail sales worldwide. This figure is expected to reach 15.5 percent in 2021. In 2016, retail e-commerce sales worldwide amounted to 1.86 trillion US dollars (The Statistics Portal, 2017; similar findings, Deloitte, 2017). Main issue in e-commerce is that prices (Zhao, et al., 2008), assortment, and availability differ greatly between different actors. This of course increases the excitement and human time spent on online markets.

In Estonia, there are companies for instance Omniva and Febest Europe Distribution together with international ecommerce giants like AliExpress, eBay and S.F. Express, which are developing additional warehousing capacity especially for e-commerce (e.g. Reimer, 2015). Preparation of post-hubs in order to accelerate up transportation of e-commerce goods for clients in Europe and Russia. According to this strategy, the e-store will send the most popular items, like mobile phones etc. to the warehouse in advance. As a client in Europe files an order, she/he gets the item from Estonia in two days, instead of having to wait for 30 days for a parcel all the way from China. Similar kind of local warehouse configuration is present in Finland for company selling mostly Chinese electronics (warehouse in Finland for short lead time shipments on some limited set of items). This distribution strategy arises from practices out of Chinese markets, where delivery of an online product is promised to be shipped in hours or next day (like JD.Com introduced years ago, see Yu, et al., 2016).

Booming e-commerce also supports shipping lines and development of the container flows through ports and container terminals. Usually most of the e-commerce commodities have been shipped out from Asia, especially from China to Europe and USA.

Leading online shopping models, and consumer interaction is also arising nowadays from China, like Single's day, which is breaking world records in hourly transactions, and is greatly supported by the desire of shoppers to follow others e.g. through sales volume statistics, online ratings and customer comments (Xu, et al., 2017).

The growth of containerization and transporting goods in containers has created many challenges for the container terminals. To meet these challenges, the container terminals have to innovate and optimize their logistics processes (Rashidi and Tsang, 2016). In practice, ports of all the other countries at the Baltic Sea are competing additionally from export-import flows for eastern-directed transit container flows as prospective growth is the highest there. Today also container penetration in Russia remains fundamentally low and this also supports containerization growth in the Baltic Sea region totally (Sorgenfrei, 2013; Global Ports, 2012).

At the same time, Russia is aggressively developing its container terminal capacities mainly in St. Petersburg, Ust-Luga and Bronka. Therefore, in the container flows it could be predicted for the coming years, that Russia-directed container flows will have a key share and will be growing year by year. However also Port of Gdansk and Port of Klaipeda are developing rapidly due to direct container calls from China and other Asia states into these ports and both are already region gateway ports. Direct call has several advantages in relation to deep sea and short sea transport. Deep sea and short sea transport is more expensive compared to direct call. Chinese container flows constitute a large portion of container flows on the global container transport. Many world seaports compete for Chinese container flows and make their efforts to acquire investments and direct calls from China to their ports (Tolli, 2008). Shipping lines like Maersk are doing strategic cooperation with Alibaba to allow customers to reserve space on its vessels through Chinese company, supporting growing cooperation between e-commerce and logistics companies. However, it should be noted that in many studies lead times are seen as one of the most challenging issue to be resolved, and this does not only concern transportation, but also manufacturing at low cost location (Kumar and Arbi, 2007; Zhang and Huang, 2012; Salam and Khan, 2016).

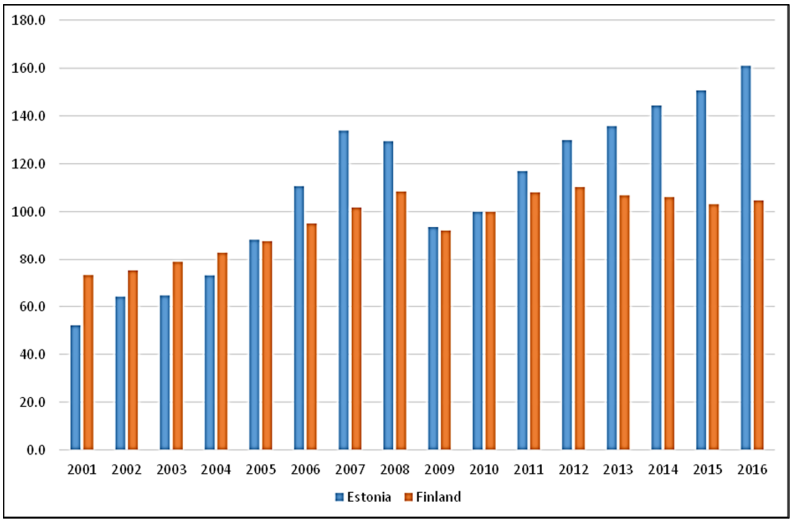

Figure 1 – Retail Trade (in Finland series with wholesale, in Estonia without it) Development (nominal) in Estonia and Finland During Period of 2001-2016 (year 2010 = 100) (Source: Statistics Estonia, 2017; Statistics Finland, 2017)

Challenging environment of retail trade in Estonia and Finland is illustrated with revenue development of this sector in Fig. 1 (years 2001-2016). Macro-economic crises of 2008-2009 (USA) and 2010-2013 (Europe) could be accessed in revenue development. Actually, Finnish development is still rather sluggish, even if this revenue data does not consider inflation development (in the case of

Finland it has been rather conservative, around 1-2% after year 2009). It is not surprising to find out that Finnish retail market development was in the group of the worst during the years 2014-2016 among EU-28 countries (Doplbauer, 2015, 2016; Hille, 2017). Estonian retail market has been performing a bit better, however, it should be noted that inflation has been double to that of Finland. Based on European wide studies Estonian retail has shown one of the strongest growths among EU-28 countries in 2014-2016 (Doplbauer, 2015, 2016; Hille, 2017). Both of these countries of course experience the effect of ageing population, where consumption typically has tendency to decline. Both countries were strong in domestic retail before the macro economic hardship experienced. Part of lacking growth in retail could be argued to belong on increased e-commerce, which has been completed by people themselves from abroad directly to their home. In here countries like China, USA, Germany and UK play important role.

Research problem of this work is related to the competitiveness and the role of intermediaries in retail business, in this case brick-and-mortar retailers and wholesalers in Estonia. Interest in examination is in China, and import products from this country to Estonia. Following research questions operationalize this study: 'What is the cost structure of imported product from China as it includes all the costs in order to be sold in Estonian consumer market?', 'What kind of role customs, taxes and logistics costs have on the overall costs?, and 'What is the competitiveness of brick-and-mortar business vs. direct e-commerce shipments?'.

2 GROWTH STORY OF ALIBABA

Chinese technology sector development has been largely ignored in west as being rather similar to innovations made already in North America and Europe. However, things have changed a lot in recent years. For example, when Alibaba listed itself through IPO to New York Stock Exchange, it received a lot of cash to grow in the following years. Even in most recently quarterly report available, ending to June (Alibaba, 2017), company reports to hold more than 21 bill. USD as cash. Situation has remained similar since IPO as Alibaba has been consistently growing in revenue and profit terms – cash position has been nurtured carefully. With around 30% operating margin, it easily over qualifies comparison group of leading North American e-commerce companies (like Amazon or eBay). What is exceptional in Alibaba, and many other Chinese multinationals, is the ability to offer customer value with price competitive overall package (Chakravarthy and Yau, 2017). Hänninen, et al. (2017) also noted in their case study of four large-scale and international e-commerce companies following: Alibaba was having lowest commissions asked within the comparison group, but also largest customer base and amount of revenue.

Fig. 2 illustrates further revenue development and return on investment during recent years. Alibaba has been growing and showing profits in the same time –

this is very untypical setting. Situation has remained as such during year 2017. Current market valuation of Alibaba is around 450 bill. USD – it is just huge company, if thinking about future prospects of investors regarding growth.

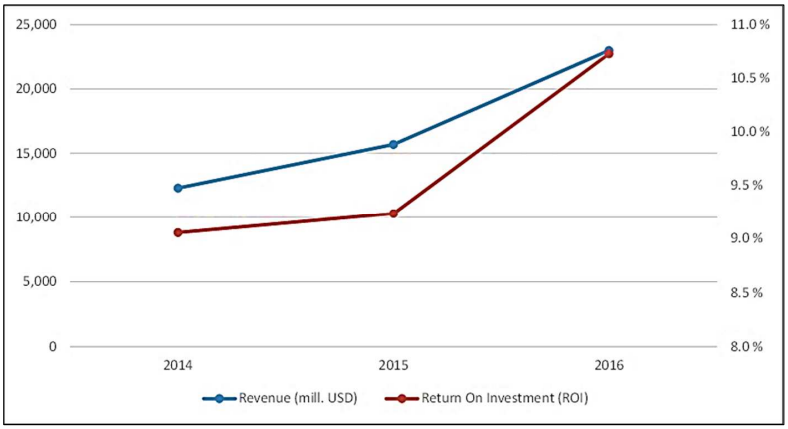

Figure 2 – Alibaba's Revenue (in mill. USD) and Return on Investment (%) Performance during Years 2014-2016 (Source: Annual Reports)

Business of Alibaba is not small scale anymore. As Economist (2017) points out, it currently handles more transactions per year than eBay and Amazon combined. Its goal is to reach 2 billion consumers in the next two decades (Economist, 2017). Business model of Chinese e-commerce companies (or technology companies) is different from west, as in Chinese model idea is to integrate much of the business in both horizontal and vertical terms (Economist, 2017; Chen, 2016). During the recent years' Alibaba has acquired companies such as Autonavi (maps), Intime Retail Group (China, traditional retail), Beijing Chuanyun Logistics, Singapore Post, Shanghai First Financial Media, South China Morning Post (newspaper), Didi Chunxing (ride sharing), Ele.me (food delivery service in China), Lazada (e-commerce in Southeast Asia), Youku Tudou (video streaming in China), and Lyft (ride sharing). Some of these companies are entirely owned by Alibaba, or in major parts. It should be remembered that one of the most important parts of Alibaba is its Alipay wallet and payment system – it is hugely popular in online commerce payments in China, and is expanding now to new markets such as Europe. It is also cheap way to have own small savings account, stored in Internet based wallet.

Alibaba is of course having most of its revenues and profits coming from diverse operations in China and Asia, but European expansion is on the agenda (and has been for years). Bury (2017) speculated that Alibaba would be keen to expand its European warehouse network based on railway corridor connections built in recent years between China and Europe (like trains serving Spain, UK, Poland and Germany). Bury (2017) reports that current warehouse network is not significant, one in UK and another one under planning to Bulgaria. Of course,

company is having numerous partners, through which it can distribute products widely and safely throughout the Europe. One of such partners is Finnish Post, which will take care of some share of shipments to Russia (Virtanen, 2015).

3 EVALUATION OF COSTS AND LEAD TIME TO REACH ESTONIAN MARKET

For the purposes of evaluating the competitiveness of Chinese e-commerce, in the course of "Transport and Warehouse Logistics" students (third year course in Estonian Maritime Academy, Tallinn University of Technology, Estonia) were asked to select product out of Alibaba e-commerce platform to be imported to Estonia. We selected Alibaba instead of AliExpress as it is merely targeted for the use of "business-to-business" transactions, and it contains information about minimum order quantities, lead times, supply locations, and maximum capacity. In the following all logistical costs were estimated with Alibaba Logistics (2017) website from where students were asked to select most convenient one for their import purposes (students groups were asked to evaluate three alternatives: full container and less than container load using sea transports as well as air freight). Destination in all of the transportation price estimates was Tallinn, Estonia. Transportation costs included insurance for the cargo. Research method in the following is quantitative case study (Ellram, 1996; Voss, et al., 2002; Eisenhardt and Graebner, 2007) out of Alibaba retail platform, which is based on publicly available second-hand data from number of different sources. This case study of four products resembles key points of importing items from China to Europe.

As importing items from outside of European Union area, importers are subject to customs payments. These were estimated with the help of Estonian Customs (2017) website, from where students searched duty class for their product, and estimated duty amount with the total cost, including purchase price and freight transportation costs to Estonia. Value Added Tax (VAT) was also estimated in this phase, but it does not have larger role in final evaluation as paid VAT in this phase could be deducted from VAT gathered in sales phase. Typical VAT percentage in Estonia is 20%. Custom duties of course are dependent, what kind of items are being imported, but in products of Tab. 1 they were around 6-10%.

For product pricing estimates, it was used margin of 70% in imported product. Above this requirement and all the costs taken into account, were added VAT of 20%. Some might argue that 70% is too high margin for imported product, but in here we have only direct product costs taken into account (as imported to Estonia), and product sales need to cover such cost items as rent of retail space, salaries, utility costs, capital costs, spoilage, warranty costs, and overhead. As reference to 70%, we could give H&M, which has been operating with "gross margin" of around 60% for many years.

As evaluating the role of freight costs in overall costs (Tab. 1), it was rather surprising to note that even LCL sea container and air freight were working

rather well, and in worst case freight costs were slightly above 8% (products 1 and 4). If full container is used, sea freight costs were really low as product 2 illustrates. Even if item price and freight cost seems to be low (as compared to VAT price), they are very important elements on cost competitiveness as custom duties, profit margins and VAT are calculated based on these two costs.

What was interesting to note during the student work completion process, was of course the long delay of sea transportation (which has been well documented in earlier research), but also time needed to manufacture products. Not all sold products are manufactured with principle of "make to stock", but rather on mode of "assembly to order" or "make to order". Most expensive product 4 took 30 days to manufacture and being available in Chinese sea port. It of course is case dependent, what is the overall lead time, but manufacturing and transportation delay together is around 60 days, if sea transportation is used. Air freight could help in here, but in case of product 4 total lead time is still at least 35 days.

What was also notable in student works, was the recommended order lot size of products. It was asked for them to calculate also Economic Order Quantity (EOQ), but this was seldom order quantity. Higher order quantities were preferred simply because of filling e.g. container to some appropriate level and/or making larger order due to long lead times to wait for other deliveries. These reasons could be causing excessive inventory holdings in real-life situations too – also decreasing the attractiveness of large-scale e-commerce from China in "business-to-business" setting.

Table 1 – Four Products, and Their Price at Chinese Location, Estimated Final Price in Retail Market (with Value Added Tax of 20%), Freight Costs, Transportation Mode Selected, and Lead Times

	Item price in EUR	**Imported Item Price (with VAT) in EUR**	**Freight costs**	**Transportation Mode**	**Manufacturing Lead Time (d)**	**Transportation Lead Time (d)**
Product 1	5.53	15.17	8.20%	LCL sea container	16	46
Product 2	0.19	0.89	2.24%	FCL sea container	20	46
Product 3	0.30	1.60	3.98%	LCL sea container	15	45
Product 4	6.60	38.23	8.82%	Air Freight	30	5

Table 2 – Breakdown of Cost Structure of Imported Product 2

Item	Sum in EUR	Share
Product purchase price	9,500.0	21.2%
Custom duties	682.6	1.5%
Transportation	1,001.7	2.2%
Profit (70%)	26,096.8	58.3%
VAT (20%)	7,456.2	16.7%
Total	44,737.2	

From product cost perspective it is important to note that actual product price, and transportation typically cover around 20% from final product total costs (like product 2 in Tab. 2). Biggest share of product costs goes to importing company profit and cost requirements, and to governmental costs such as custom duties and VAT (see Tab.2). Even if in the future margin taken by importing company would decrease to 50% (or that of 30%), it could be so that items acquired from Asia get much higher priced due to growing salaries, appreciating currencies, and other costs. Therefore, in the future role of importing company (wholesaler and/or retailer) would just decrease, but other cost classes would increase. It is notable that driver of other cost classes is the acquisition costs of sold product, and the acquisition costs to final destination. If these together will increase, so will custom payments, and possibly VAT (last one depends on overall costs). Tab. 3 illustrates situation further, where actual product price increases by 100%, and profit requirement of importing company decreases to 30% (other factors remaining as the same from Tab. 2).

Table 3 – Breakdown of Cost Structure of Imported Product 2, in Hypothetical Future Situation, When Product Price Increases by 100% and Profit Margin Requirement of Importing Company Is Only 30%

Item	Sum in EUR	Share
Product purchase price	19,000.0	30.5%
Custom duties	1,365.2	2.2%
Transportation	1,001.7	1.6%
Profit (30%)	30,524.2	49.0%
VAT (20%)	10,378.2	16.7%
Total	62,269.40	

In this potential future scenario, overall costs on the shop shelf of the product shall increase by 39.2% (as comparing total costs of Tab. 2 and 3). In import of product 2 transportation costs are really low due to the use of full containers, and therefore also transportation element contains pressure to increase in the future

(mostly due to historically low container transport rates of sea vessels). Due to this, it is reasonable to assume that Chinese manufacturing (and Asian manufacturing) shall seek new low cost places from areas not being so overheated - one example is the manufacturing expansion in Central and Western China. From this new location perspective, it is also important to develop other transportation routes than sea transportation or air freight. By utilizing these "old" solutions, transportation lead times ought to increase even further, leading to excessive inventory in the logistics system.

E-commerce also plays important role in the further growing exports from new manufacturing locations, and also old ones. However, based on Tab. 2 and 3, this is not necessarily smart to execute through business-to-business sales. Middle-man, or in other words local importing company, needs to be removed from equation, if cost pressure is desired to be managed. Therefore, growth of e-commerce from Asia to Northern Europe based on this short analysis ought to come from business-to-consumer type of sales.

Table 4 – Breakdown of Cost Structure of Imported Product 2, in Hypothetical Future Situation, When Product Price Increases by 100% and Middle-Man Is Removed from Supply Cost Structure (Directly from China to Consumer)

Item	**Sum in EUR**	**Share**
Product purchase price	19,000.0	74.1%
Custom duties	1,365.2	5.3%
Transportation	1,001.7	3.9%
VAT (20%)	4,273.39	16.7%
Total	25,640.30	

Effect of removing middle-man from increasing cost situation could be seen in Tab. 4. Total costs will decrease by 42.7% from the original situation, where manufacturing was still cheap in Asian location, but there were local retailer having own profit requirement. In practice saving potential is not as high as transportation solution is in any case more costly for single consumer ordering product to their home. It is also doubtful whether product prices can remain as low as for bulky orders of larger retailers. In addition, global e-commerce needs to develop custom routines for ordinary customers more convenient in order that this approach will spread as more common among larger population.

4 CONCLUSIONS

When IT-boom was heating on during the late 1990's, world saw the first e-commerce shops to open, for both business-to-business and business-to-consumer markets. These portals were typically concentrating on some very limited product groups, like books and/or music CDs. A lot has happened

thereafter. New changes will take place, as consumer direct model will become more common in long-distance sales. For example, in Europe people are increasingly going online, and they are shopping e.g. directly from China. This is already present in retail sector as it is difficult for "brick-and-mortar" companies to sustain and be profitable. We have witnessed many bankruptcies in USA/North America, but also in Europe due to this (especially in Finland some very large-scale chains have just disappeared). Numerous iconic retailers in both side of Atlantic are in big trouble.

Based on the analysis completed in this work, current import from China at retail shelves contains a lot of governmental customs and taxes as well as profit, overheads and operative costs of retailers/wholesalers, and actually manufacturing and logistics costs are minority. However, this could change in the forthcoming years as Asian economies start to dominate within group of larger economies of the world, and their currencies will appreciate. Especially in this situation of growing manufacturing costs, analysis of this research work showed that direct ordering from China by individual without middlemen is clearly economically justified, and results in huge savings within overall costs. This direct model can tackle coming inflationary price increases, however, it will mean troubles for brick-and-mortar wholesalers/retailers as well as partially for local government in terms of lower tax gatherings (VAT, as this tax is based on final price paid in the market, and prices will be lower at border).

In this research work, we were interested mostly about Estonian market. Retail sector has been one of the healthiest in Europe in this country, and new malls as well as shops have been opened in recent years. We do not see the business of shops selling cheap Chinese items as long-term and sustainable strategy. Merely, shops should specialize and sell increasingly local or regional products (or bundle services to product sales). As "consumer direct" model will spread around further, growth and profitability of Asian import based local retail model will face difficulties. It already is doing so (Deloitte, 2017). During the exercise of Section 3 of this paper, we checked with students, the pricing of products planned to be imported. It was in many cases the situation that price of product to be imported was around estimated price with 70% margin or it was somewhat below it. This only further indicates that companies are trying to achieve such high margins, but it is of course difficult to do so.

For logistics sector, e-commerce makes rules and life a little bit different. Companies, shipping lines, warehouses and hinterland transports should transform themselves to serve small parcel deliveries, instead of delivering large lot sizes. This is difficult task to be completed with profits. New technologies and techniques need to be implemented. However, for logistics sector this path must be taken as growth e.g. in container transports is very limited in the following decade.

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Criteria of Innovativeness and Creativity in Start-Ups and Innovative Entrepreneurship

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ABSTRACT

Purpose: Innovativeness and development have become one of the greatest competitive advantage of all organisations. In order to develop innovations, human resources and their development are the main sources of creativity and new ideas, skills and their application. Therefore, this paper aims to investigate and identify approaches to enterpeneurship innovativeness. Furthwermore, paper develops current success criteria of start-ups based on qualitative research made with start-up leaders.

Methodology/Approach: The data were collected by means of a quantitative questionnaire research carried out among employees of organisations across sectors who take part in a talent programme in the Czech Republic. Moreover, qualitative research of start-up projects by means of content analysis was carried out among start-up organisations. For the analysis key words and short phrases were selected to find success criteria of start-ups. For the purposes of testing, the Pearson's chi-square test and the association test were employed.

Findings: The results have shown statistically significant differences between the age category and creativity ($p = 0.048$) and the length of job history and the creativity demonstrated when performing job ($p = 0.012$). Furthermore, education plays a role in innovativeness. University education may cause lowering of creativity by teaching standardized thinking. Moreover, results of study have shown that key success criteria ($p = 0.000$) of successful start-ups are: use of education and training, development, partners, theoretical mapping, use of expert help, use of concrete technologies, knowledge of project management, project functionality, personal interest in project delivery and efficiency of solution.

Research Limitation/implication: The results develop practice in defining key success criteria of innovative approach in enterpreneurships, start-ups and innovative-oriented organisations. The limits of the article can be deemed to

consist in a relatively small sample of respondents; however, with respect to the exclusive approach to the talent management in the Czech Republic, the sample can be described as sufficient. The results may inspire other researches to conduit further research in other conditions and deepen knowledge about this phenomenon.

Originality/Value of paper: The contribution of the article lies in identification and evaluation of the factors of innovativenes of enterpreneurships. Furthermore, practical contribution lies in identification and evaluation of the areas of the sustainable development of social start-ups. Practical contribution lies in presenting the concrete results from real start-up projects and innovative-oriented organisations. The results are important for development of new start-up ideas and project while their main efficient approaches are presented.

Category: Research paper

Keywords: start-up; development; creativity; innovation; success

1 INTRODUCTION

The current main goal of all organisations is to keep and develop quality people (Ahsan, et al., 2013; Brewster, Sparrow and Harris, 2005). It is obvious that one of the crucial things, in order to upgrade the organisations' and economy level, are people and their management. Human resources and the ability of their management and development is irreplaceable in the current knowledge economy (Bowen and Ostroff, 2004; McDonnell, Lavelle and Gunnigle, 2014; Gururajan and Fink, 2010; Manning, 2010; Claussen, et al., 2014; Brown, Hesketh and Williams, 2003). Therefore, entrepreneurs should focus on education and learning process of each single employee. It is necessary to monitor the process and reactions of people within an organisation on education and development with regard to their personality, kind of work, social values and behaviour – each person is an individual with different perception and reactions (Beech and Brockbank, 1999; Loke, et al., 2012; Michela, 2007). People who are being educated and developed usually higher their interest in further development, they get to know the learning process and use of their abilities; they also learn how to manage and use their reactions on learning and development and how to continue in the learning process in higher level. They also find how to use their new skills and knowledge to upgrade their performance. Individuals who are constantly educated also work towards organisational goals and follow organisational strategy; they are communicative, cooperative, proactive, respectful, customer-friendly, willing and able to constantly learn (Carnicer, et al., 2004; Collings, 2014; Li, et al., 2009). As Gururajan and Fink (2010) have stated, measuring the level of education and the process evaluation in organisations is necessary for predicting future development.

Innovativeness of each individual based on learning and development process is a theme which is rarely studied. Every manager knows employee's behaviour

varies over time, but this within-person variability is not well described, understood and sometimes is treated as an error (Dalal, Bhave and Fiset, 2014). Therefore this study is focused on identification of specific approaches to support people development and innovativeness within entreprenurship. The current extant theories of creativity development and innovativeness focus on the contention that the process of organizational support is rather static than dynamic. Contrary, Day, Sin and Chen (2004) state that a considerable proportion of the variability in job behaviour is affected by numerous variable sources. Although the benefits of understanding creativity in job behaviour are wide, there is a lack of clear knowledge about the systems and rules of types of people behaviour in reaction to specific stimuli. This paper reveals various approaches to stimulation of creativity and innovativeness in job behaviour by type of person and conditions in the organisation.

The whole construct of variability in creativity and innovativeness is very complex. Thus investigations in this area are useful because experiment and research will provide a more scientific understanding of the process during work and development. On the other hand, it is important to note that theorizing is usually frequently used in theory, but empirical results are rare and do not differ because of their narrow focus (Dalal, Bhave and Fiset, 2014; Curran and Bauer, 2011; Beckmann, Wood and Minbashian, 2010).

This paper aims to investigate and identify approaches to enterpeneurship innovativeness. Furthwermore, the paper develops current success criteria of start-ups based on qualitative research made with start-up leaders.

1.1 Theoretical Background

People development and innovativeness are truly crucial for organisational and economy development. But the process of development and innovativeness cannot be unified. From a long-term point of view, labour markets show a higher unemployment rate; on the other hand, they struggle with the worldwide phenomenon characterised by the lack of talent and innovations (Bernat and Korpysa, 2013; Cheese, Craig and Thomas, 2008; Collings and Mellahi, 2009; Gannon and Maher, 2012; Stahl, et al., 2012). The organisations subsequently make an effort to solve this problem by the influx and recruitment of foreigners. On the other hand, multiculturalism within an organisation supports diversity and contributes to increased competitiveness (Silzer and Dowell, 2010; Deb, 2006; Keil, 2007). Furthermore, yet another phenomenon has been identified - the departure of talented workers and key employees abroad.

Based on Wang and Wang (2012), Linhartová and Urbancová (2012) and Maroušek, et al., (2015) we may say that increasing competitiveness while simultaneously decreasing costs is currently considered the most burning issue. The desired outcome may be achieved only by having the right people in the right places, i.e. by hiring, retaining and developing talented employees who will

become potential successors (Levy, 2011; Wong, 2009; Beazley, Boenisch and Harden, 2002).

Cheese, Craig and Thomas (2008), Gallardo-Gallardo, Dries and González-Cruze (2013), Al Ariss, Cascio and Paauwe (2014) and Cannon and McGee (2011) state that typical for talents are innovative and creative approaches to problem solving. Based on results of many surveys carried out by numerous authors, abilities are only improved over the time and through efforts. Authors Collings and Mellahi (2009), identically state that it is necessary to work on the development continuously to reach sustainable innovativeness. Colvin (2010) say that the mind can be trained equally as athletes train their body. It is possible to develop oneself continuously and surpass the existing limits. The more the mind is used, the more chances for further development and innovativeness will arise. Equally, Maxwell (2012) characterises advancement and development as highly difficult. The author says that whenever a person wants to advance, he or she has to be more determined, invest in it more (energy, learning, risks – which, however, are extending abilities that have been already developed and continue developing) than it was necessary to get to the current level, no matter how high it is. Collings and Mellahi (2009), Dell and Hickey (2002) and Maxwell (2012) therefore advises encouraging development of people in entrepreneurship.

A sign of talent is usually creativity (Turner, et al., 2007) or ability to improvise quickly. Berger and Berger (2003) are in agreement with this, categorising creativity as one of nine representative key competencies that talents should abound with, for example, together with communication skills, professional qualification and target orientation. Meyers and van Woerkom (2014), and Ledford and Kochanski (2004) say that motivated employees use their creativity more, are able to come up with original ideas and introduce innovations in their work (Maruta, 2012). And a lack of creativity or innovative behaviour is often understood as one of the basic causes of failure of an organisation (Yapp, 2009). According to Meyer and Allen (1991), Glomb, et al. (2011) and Martín-De Castro, et al. (2013), it is, therefore, necessary to create and maintain such organisational culture that makes innovations and creativity possible. The same characteristics should be always required from managerial staff when they should importantly have not only a creative potential but also the ability to inspire their subordinates and colleagues or the ability to create adequate conditions.

The above-mentioned implies that it is not enough for organisations to only identify their talents, it is necessary to continue working with staff and guide them correspondingly. In addition, authors Vancouver (2012), Pearce and Randel (2004) and Linhartová (2012) have found out in research that under various conditions the results of a single personality are different - may be positive, negative, or not anyhow affected. Research and meta-analysis of authors Sitzmann and Yeo (2013), Lin and Chang (2005) and Chapman, et al. (2005) have further concluded that the results and applicability of development (output and efficiency) do not depend on the prerequisites for development, age (Young, et al., 2008) or satisfaction (Fisher, 2003; Judge, et al., 2001) (correlation 0.01),

but rather on the relationship between prerequisites and past performances, by which an individual has already manifested prerequisites (correlation 0.32). Similarly, the correlation with the objectives is positive (Bandura, 1997; Judge, et al., 2001).

Hiam (2003) adds that just start-ups can, thanks to their pioneering orientation, take potential initial advantages, which can create and maintain a competitive advantage of an enterpreneurship. In all sectors of economy, there is necessary to support creation of new companies (start-ups) that have something to offer on the market, have a potential to gain a hold onto the market and achieve success. Nowadays, commercial companies also endeavour to create opportunities for start-ups, primarily in the sphere of socially-oriented start-ups with the support of new technologies. In strat-ups, there has been very often placed emphasis on the focus on the sphere of education, extend access to resources for people at risk on the labour market and for people at risk of social exclusion, on access to information and data that enable to realize social innovations, accessible and quality social and health services, supporting and developing social businesses, community development, creation of job opportunities and, last but not least, equality and diversity. Start-ups are intended to bring new solutions for a specific problem that would be more effective than the existing alternative, while the project should have a demonstrable positive impact on the lives and also organizations (Hiam, 2003). Shepherd, Douglas and Shanley (2000) highlight the importance of the human capital. The most common criteria, according which the potential investors make their decisions, are team, the product itself and used strategy (Agha, 2014) or the urgency for information (Hartmann, et al., 2016).

2 METHODOLOGY

The paper was prepared based on the method of secondary and primary source analysis, knowledge synthesis, induction, deduction and comparison. From secondary sources, the analysed were scientific monographs and scientific articles in the database of Web of Knowledge and Web of Science dealing with creativity, development and innovativeness.

Quantitative research

Primary data were gathered through a quantitative survey, using questionnaires as a method of the data collection. The survey was carried out among organisations operating in the Czech Republic. Only one respondent per organisation was contacted who took part in talent program. The data collection has respected the ethical aspects of research (Act No. 101/2000 Coll., on Personal Data Protection). The questionnaire focused on the areas of organisational development, innovativeness and its support (tangible and intangible rewards, learning and development, plans, mentoring, coaching, time to learn, constructive feedback), perception of support by employees, employee attitude toward innovations, targets of development and outcomes – innovations,

promotions, organisational growth, reputation, brand and social responsibility. The sample group consisted of 134 respondents. The employees were in the main employment. The method used for the collection of data was an electronic questionnaire that automatically recorded and pre-categorised respondents' answers (CAWI method) and telephonic interviewing (CATI method). The selection of a representative sample across sectors was carried out by selection of e-mail addresses and telephone numbers, which incorporates the advantages of multilevel random selection. The sample was selected solely for the purposes of the survey. The structure of the employee respondents addressed was as follows: by size of the organisation they work for: 42.5% from small, 22.4% from medium-sized and 35.1% from large organisations, by ownership of the organisation they work for: 53.0% Czech organisations, 14.9% Czech ones with a foreign owner and 32.1% supranational organisations. Most of the employees, 76.9% in total, do not hold a managerial post; they are rank-and-file employees. The respondents' age structure was the following: up to 24 years 24.6%, 25 to 30 years 23.1%, 31 to 40 years 29.1%, 41 to 50 years 14.9% and more than 50 years 8.2%. A total of 56% respondents have completed secondary education and most respondents, i.e. 41% have completed at least bachelor's studies (university). The addressed employees have a different length of their job history: less than 1 year 15.7%, 1 to 5 years 44.8%, 5 to 10 years 17.2% and more than 10 years 22.4%.

Qualitative research

The qualitative research was carried out using quantitative content analysis of interviews with technological start-ups with a social impact in incubator supporting projects from the whole Czech Republic. The interviews were drawn during November 2017. The total number of strat-up projects that met the conditions of the project assignment and had been evaluated was 17. Teams had 1 to 13 members, the modus and the median of the number of members was 4, and the standard deviation was 3.02. For the progression into the acceleration phase, 5 projects out of 17 projects have been selected. The results of the projects are therefore compared according to their progress to the next phase to identify spheres that are determining for the project progress. The interview included 18 open questions focused on a project description, description of a solved social problem, description of a project team, previous experience of the team, description of a planned impact, knowledge of the target group, description of the solution, actual state of the market with substitutes, description of the innovative solution, competitiveness of the project, planned impacts, technical solution, conditions of the project development, sustainability, financing, scalability, co-operation with partners and contribution towards goals of the sustainable development.

The use of the quantitative analysis has been decided because this method makes it possible to reveal those aspects of the text that are not apparent at first sight in a given amount of information. According to Disman (2009), the procedure of the quantitative content analysis reflected steps with partial modifications in accordance with the context of the research. At first, all interviews were rewritten

and read through and then key words were defined to be surveyed, i.e. words, phrases or other parts of text with a similar meaning, which were categorized into categories and there were defined units to be analysed – individual concepts repeatedly mentioned in most or all of the documents concerning a focus of a project, supporting documents for its processing and justification of its viability and its positive impact on the target group become units for analysis. The concepts were observed as a whole (in a certain context) but also the attention was focused on their individual components (words), phrases.

The categories were created while reading the interviews and there were observed selected qualitative variables, while primary nouns (the synonyms were merged under the same category) or their logical groups were recorded. Totally, 39 criteria were evaluated. In particular, the following concepts and their synonyms were used: the resulting solution (platform, portal, web, application, mobile, on-line, telephone, internet), use of education training (mentor, coach, lecturer, consultant), development, partner, acquisition, project creation (idea), potential / opportunity, impact outside the Czech Republic (international, foreign), market (offer, demand), application for commercial sphere (practice, companies, institutions), team skills or their development (experience, knowledge, skills, talent, capabilities, qualifications, competencies), region, theoretical mapping (model, system), solution for the target group (benefit, advantage), focus on the social sphere (society, environment, social public), focus on the sphere of education (education, school, workshop, course), description of the target group (youth, senior, student, pupil, child, woman, family, parent), the process of making solution (co-operation, interconnection, innovation), awareness of resource use (utilization, implementation), conception of newness and results (impact, use, innovation), project as a business plan (entrepreneur, business), use of professional assistance (specialist, expert), conception of output (service, product), use of technologies (technologies, digital, robot, interactivity, software), performed analysis of a solution (analysis, analytics, measurement, evaluation, research), conception of project communication (marketing, advertising, promotion, PR), conception of project management (manager, management, managing, self-management, leadership), conception of job opportunities (job, employment, employee, workforce, position), identification of co-workers (team, group, community), solution functionality (function, functioning), solution description (process, solution, design, tool, prevention, measure, automation), description of project financing (finance, support, grants, resources, investments, investor), data base (data, information, database), targeting (goal, target group), problem identification (limit, problem, barrier, handicap, indisposition, loss, dispute), interest in a solution (motivation, engagement), effectiveness of solutions (effectiveness, efficiency), use of psychological approaches (psychology, psyche).

As mentioned, in some cases when appropriate, there have been created also categories of the second and third level that ramify the main categories even more. So the whole research problem has been covered and further the big

amount of data has been reduced and the less important data has been eliminated which made their interpretation easier. For the creation of the qualification system, there was chosen nominal quantification monitoring the frequency of occurrence of particular units in each category. The subcategories were subsequently merged under the main categories and the number of occurrences for each category was recorded. The results obtained using the mentioned method were subsequently evaluated and processed. All the primary data was first summarized, processed into tables and subsequently evaluated using tools of descriptive statistics.

Data processing

The first stage of processing the questionnaire results focused on the preparation of a data matrix. The data was described and then it was coded and sorted according to the type of variables (qualitative, quantitative). During this phase, the data was also cleaned and its quality was checked in order to uncover any extreme (eccentric) or deviating observations which could significantly influence the results of some analyses. An integral part of this stage included an analysis of any missing values which were supposed to identify and replace any such missing values. The last part of the data matrix involved the transformation of the variables which was necessary for several reasons. When processing a multidimensional data file, the reason for this is usually the requirement for the fulfilment of the conditions of a certain statistical method. The respondents' answers were categorized according to the identification questions which formed the first part of the questionnaire. In the survey, the measurement was based on closed questions with one or more possible answer(s) which were selected on the basis of studying literature, documents and other related studies.

The processing of the results was based on analysis of the data focused on investigating the important properties and the typical features of the statistical file. The statistical evaluation of the data was undertaken firstly by a one-dimensional analysis based on the frequency distribution, the calculation of point and interval estimates and the testing of hypotheses about the frequency of the categories of individual variable values. The results were evaluated by descriptive statistic instruments, namely absolute and relative frequency, dependency tests and dependency force tests. The Pearson χ^2 test was applied and if the p-value was lower than $\alpha = 0.05$, the zero hypothesis was rejected and an alternative hypothesis assuming the feature existence was accepted instead (Hendl, 2012). Additionally, the association analysis was employed to detect a potential dependency among the attributes in question. A scale according to de Vaus (2002) was used. The test was suitable because statistical conditions complied with the rules of its application: no interval with zero frequency, up to 20% confidence intervals at the frequency less than 5 (Hendl, 2012; Pecáková, 2011). The validity of construct and its parts were tested by Cronbach Alpha. The goal of the comprehensive analysis of several variables was to uncover any relations between data structures and to find an interpretation for these structures.

3 RESULTS

The chapter deals with approaches towards innovativeness invesstigated bot hy quantitative and qualitative research. First, quantitative research results are presented followed by results of the content analysis.

Innovativeness in organisations

Within the quantitative research, an assumption to be examined has been identified among theoretical starting points, when the theory often mentions creativity and innovativeness in relation to employees' talent. The results show that 30% of the addressed employees prefer strict adherence to tasks according to their job description, whereas 70% of employees demand creativity, although they cannot always use it in their position, as shown by the results. The results on employees' interest in creative work based on the ownership of their organisation (national, national with foreign owner or international) did not show any statistical differences (Chi-square p-value is 0.082, the association coefficient 0.190). It can be stated that no difference exists in creative work requirements by ownership of the organisation where the employees work. In purely national organisations, creative work is demanded by 67.6% of employees, in national organisations with a foreign owner by 55% and in supranational corporations by a total of 81%. This result corresponds to the overall orientation of the majorit of employees on their own development. This also contains willingness to continue learning and developing, to work on creative projects and tasks and to define the focus and innovative method of work themselves.

The next examined aspect of creativity at work was the size of the organisation. Again, as in case of ownership of the organisation, no statistically significant differences have been identified ($p = 0.327$). In total, creativity-oriented is 74.5% of employees in large organisations (more than 250 employees), 60% employees in medium-size organisations (50 – 249 employees) and 70.1% of the employees under review in small organisations. In case of talents placed in talent programmes, creativity is slightly more used in large organisations and small (micro) organisations. According to the survey findings, the reason for that is that large organisations have a markedly higher need to train managers and specialists and use talent management more often and small organisations put emphasis on development and training of employees who are not numerous in these organisations and therefore the accent is put on their quality and innovativeness.

Another examined assumption was a difference in creativity between managers and employees. However, statistically, significant differences have not been found here either ($p = 0.082$, the association coefficient 0.145). No difference exists in the creative work requirement by position – neither for managers, nor for rank-and-file employees. Creativity at work is demanded by 80.6% of the managers under review and by 67% of employees. Although the creative work requirement is higher in case of managers, the difference is not significant. Creativity is a popular aspect of work for all types of employees in all types of organisations. Differences have been identified only in case of work on one's

own projects and personal benefit of education and development. Managers are more aware of the benefit of education and development for their own personality. Their education and development focus more on development of a specific person rather than on specific skills for performance of work.

Interesting results, however, were produced among employees and their creativity by age categories (Chi-square p = 0.048, the association coefficient is 0.258). Younger employees were proved to be more creative. Young people between 25 and 40 years of age to the most extent. The younger age category (20 – 25 years) is still learning; they prefer receiving clearly specified tasks and creativity is not a priority for them. On the contrary, employees more than 40 years of age do not want to experiment anymore and again they prefer specified tasks. Moreover, a statistically significant dependency has been proven – the employee's age influences his or her creativity and interest in creative solutions of tasks or projects.

Use of creativity by the highest level of education completed does not significantly differ (Chi-square p = 0.213). The results show no existing differences in creative work requirements in differently educated employees. Creativity at work is called for by 64% of the employees with university education under review, and 78.2% of employees with secondary education. This means that the ratio is approximately same in both categories. However, it is surprising that employees with a university education are interested in creative work at the least percentage of the groups mentioned. Nevertheless, university education may have an influence on creativity, when the length of studies shapes personality and turns creativity into an average, as a result of the long-term education. On the contrary, creativity of employees with secondary education is higher – being probably still not so much affected by formal education. There is room for a further research here. Employees with secondary education were slightly more numerous when compared to employees with university education.

The last examined differences were between the length of being with the organisation and creative work (Chi-square p = 0.012, the association coefficient 0.274). According to the survey results, new employees are more creative (when being for 1 to 5 years with the organisation). A longer work in the same organisation inhibits the interest in creative tasks and independent work. However, it is surprising that creative employees are those being with the organisation for a long time (for more than 10 years). They have deep knowledge of the organisation and can work with it. They are creative and bring in new approaches to work. There is also a dependency, i.e. time spent with an organisation affects employees' creativity.

Start-up attitude

Within the qualitative research, the occurrence of the 39 defined criteria (see Methods) were evaluated for the projects progressing to the next stage of the start-up project accelerator, compare to the proportion of the occurrence in non-progressive projects to be able to see differences between progressive and non-

progressive start-ups and test the criteria related to it in order to find statistically significant differences showing different approach of successful start-up projects.

Results show that the progressive projects were using some of examined criteria in all cases, while non-progressive projects neglected them. This neglection resulted in the insufficient sophistication and readiness of the project or its insufficient impact on the target group, or unrealizability of the project. The Chi-square test confirmed statistically significant differences between progressive start-ups and non-progressive start-up projects ($p = 0.000$) based on their progress to the next stage (acceleration). The projects that have progressed to the acceleration phase have used more often all the defined criteria in description of their project. The use of all studied criteria was more frequent and, also all these criteria were used. The projects which did not progress to acceleration stage did not reflect some of examined criteria or did not pay any attention to them. As the occurrences of examined criteria have significantly varied in some cases, they were further tested. In particular, statistically significant differences were found in the case of the following criteria (for all of them $p = 0.000$): use of education training (mentor, coach, lecturer, consultant), development, partner, theoretical mapping (model, system), use of technical assistance (specialist, expert), use of technologies (technologies, digital, robot, interactivity, software), conception of project management (manager, management, managing, self-management, leadership), solution functionality (function, functioning), interest in a solution (motivation, engagement), and solution efficiency (effectiveness, efficiency).

4 CONCLUSIONS

The article expands the understanding of the innovative potential of human capital in organisations and start-ups and criteria which are related to it. The proactive behaviour towards development leads to increase development and innovativeness.

The results show that there are statistically significant differences between the age category of employees and their creativity and innovativeness ($p = 0.048$) and the length of employee's job history and the creativity that he or she demonstrates when performing his or her job ($p = 0.012$). The most creative and innovative are employees between 25 and 40 years of age. Moreover, employees working at organisation from 1 to 5 years are more creative and innovative than others. Surprisingly, employees working in organisation for more than 10 years are also more creative because of their deep knowledge and experiences. Employee education plays a significant role in innovativeness. University education may cause lowering of creativity by teaching standardized thinking. Employee development also lower employee mobility and positively influence length of their employment and productivity. A positive finding is that employees are often self motivated and look for new ways of growth and innovativeness.

The results of the presented study supported with quantitative content analysis showed that projects can be assessed according to the 39 identified criteria. From these criteria, 10 criteria were identified as crucial for further development and realization of the project. These were: use of education training, development, partner, theoretical mapping, use of technical assistance, use of technologies, conception of project management, solution functionality, interest in a solution, and solution efficiency.

The results may be used in practice to deveelop people within entrepreneurship according to their possibilities and abilities which significantly differs according to the results. This is supported also by theory, as confirmed by Vancouver (2012), Young, et al. (2008), Fisher (2003) and Sitzmann and Yeo (2013). The enterpreneurs are suggested to act and develop people accodring to the defined criteira: age, length of employment and education because every time ste result is different - may be positive, negative, or not anyhow affected.

Moreover, practice can use also identified criteria of project or start-up successful development. Focus on the ten defined criteria will hiher the chance of acceleration and real impact and implication of projects. Furthermore, practical contribution of this article lies in presenting the concrete results from real organisations and start-ups. The results are important for development of new start-up ideas and project while their main efficient approaches are presented.

The limit of this paper is the subjectivity when choosing particular used definitions and categories for the content analysis. Secondly, the procedure during the creation of categories of the analysed content and the inclusion of individual words or phrases into these categories.

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Management of Organizational Culture in the Public Institutions of Ecuador Educational Sector

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ABSTRACT

Purpose: The current study has, as its fundamental objective, the conceptual analysis of organizational culture management models that could be applied in public institutions of the education sector, as well as on management models of the organizational culture mainly those aimed at providing customer services in this sector.

Methodology/Approach: It was made an analysis of the main models that exist, and the possibility of adapting them to public institutions in the educational sector, which will improve the management of the organizational culture, according to processes that take place within them.

Findings: The non-existence of organizational culture management models aimed at providing customer services in public institutions of the educational sector was identified, as well as the complexity of applying other models of organizational culture management in institutions of the sector referred to from the gaps that they present.

Research Limitation/implication: The analyzed models are directed to private and public companies, they do not present methodological frameworks of action beyond the elaboration of business strategies, that allow to be applied directly in organizations with academic aims.

Originality/Value of paper: The document was based on the literary review of management of the organizational culture, in which it was detected that the models studied are aimed at companies, being complex their adaptation for institutions of the educational sector. No references were found about management models of the organizational culture focused on the provision of services to the client, which brings novelty to future research.

Category: Literature review

Keywords: management; organizational culture; model; public institutions

1 INTRODUCTION

In former studies, it is exposed that the organizational culture has generated significant contributions in the direction and conduct of the human being. The continuous search of the relationship between the dispositions and the management in an organization implies a feasible process of culture formed by beliefs, values, myths, shared feelings and way of acting where union and collaboration is fundamental for the achievement of a pleasant environment, a key factor for the success of public and private institutions.

Organizational culture is a set of paradigms, which are formed throughout the life of the organization as a result of the interactions among its members, of these with the structures, strategies, systems, processes and of the organization with its environment, from which a set of references is formed, which will be valid as they guarantee the efficiency and effectiveness of the organization (Alabart, 2014).

The organizational culture is linked to different factors that contribute to the strengthening of institutions putting into practice the knowledge acquired in terms of procedures, rules and policies, demonstrating skills and dexterity in the activities that are developed. Educational institutions should be oriented towards the management of the organizational culture that will allow it to be sustainable in a changing world.

Public institutions should focus their efforts on finding solutions to the different problems that arise in the internal part, motivated among other causes by deficiencies in terms of leadership, communication, teamwork, decision making, and the poor implementation of policies and current regulations, among other aspects, which induces a division among the public servants of the different areas. That is to say that the management of the organizational culture should lead the educational institutions to include improvements in the processes that are developed, promoting the permanent training of the personnel, and establishing more efficient ways of managing this activity, always in order to satisfy the internal and external customer, within the framework of university social responsibility as it has been studied by Faría, Salazar and Castellano (2017).

This paper considers the conceptual analysis of organizational culture management models that could be applied in public institutions of the education sector.

2 ANALYSIS OF THE DEFINITION OF MANAGEMENT OF ORGANIZATIONAL CULTURE AND MODELS OF MANAGEMENT OF ORGANIZATIONAL CULTURE

Culture is presented in all human activity, so it is necessary to inquiry about the management of organizational culture (OC), which will strengthen values, communication, decision making, performance, among others, in the operation of public education institutions.

2.1 Management of Organizational Culture

The management is characterized by a broad view of real possibilities of an institution, which allows to solve a problem or achieve a specific purpose. That is, it is the set of integrated actions for the achievement of a goal at a certain time; it is the main task of the administration and an intermediate link between planning and the specific objectives to be achieved in an institution.

Mintzberg (1984) and Stoner (1996) have defined that the term management is the disposition and organization of the resources of an individual or group to obtain the expected results. It could be generalized as the art of participatory anticipation of change, with the purpose of permanently creating strategies to guarantee the desired future of an organization; it is a way of aligning efforts and resources to achieve a certain goal.

The traditional meaning of the concept of management is directly related to that of administration, and means "to make conducive diligences to the achievement of some objectives" (Ramírez, 2005).

García (2006) indicated that the management of the OC is conceived as a process that takes place in a planned and unidirectional manner, that is, the values and institutional policies determined by management are disseminated throughout the organization, with the intention that these are internalized by the people and in this way they build commitment and organizational identity on behalf of the employees.

CO is fundamental for the management of knowledge in any type of institution, which is generally understood as the set of values, principles, ideas, customs, habits and traditions that are shared by all people who are part of an organization. Toca (2009) defines the organizational culture as "a shared social understanding, product of assumptions and common visions among the members of an organization", and different levels of culture are distinguished: basic assumptions, values or ideologies, artifacts (slang, stories, rituals and decoration, values and ideologies) and practices.

Naranjo, Jiménez and Sanz (2012) expressed that the organizational culture is considered as one of the key elements in innovation, both in its improvement and in its inhibition. Organizational culture is considered in literature as one of the factors that can most stimulate innovative behavior among the members of the

organization. Robbins and Judge (2013) exposed that it is a "Perception shared by all the members of the organization: System of shared meanings". Likewise, culture helps the organization to distinguish itself from another; implements the sense of identity and unity; focuses on the interest in the majority rather than in self-interest; strengthens the stability of the social system as a social glue that holds the organization together; it serves as a control mechanism and shapes the attitudes and behavior of employees.

Whatever the theoretical perspective adopted on the conception of organizational culture from the rational aspects or from the emergent ones, it is necessary to take into account that in order for the management systems in organizations to be conducted with greater probability of success, it must always be based on the characterization or analysis of culture; that is, doing a study to know and understand the aspects that define it. Likewise, a comparison of these results is made with the characteristics of the management systems in order to identify the degree to which the factors of culture and management systems are coherent with each other (Vesga, 2013).

The management of organizational culture is the formula of the companies of great prestige for these times, is the way in which they are achieving a differentiating factor, which brings results of impact on these. In this way we could say that a solid and integrated culture; consistent with the objectives and the environment, it makes the difference between a high performance company and a low performing one (Bernal, 2015).

Organizational culture influences the efficiency of knowledge management, because culture acts as a mediator between individual knowledge and that of the organization, and also generates spaces for social interaction that allow the creation, exchange and application of knowledge. A knowledge-oriented organizational culture will remain if it is adequately supported by top management since capturing and sharing knowledge requires time and continuous support (Rojas and Vera, 2016).

It is considered that culture is created as a variable that can be transformed through techniques, with the purpose of improving the behavior of people with integral objectives. Adequate understanding provides a strategic vision for change through the study of each institutional reality, so that the relationships of the internal and external environment will improve, applying the different definitions that strengthen the knowledge and behavior of the individual. In this way it could be stated that the management is oriented to the OC in order to strengthen the institutions through strategies and standards, which should be applied for a better functioning, nevertheless, it should create awareness and strategic commitment in each one of the members if they want to achieve institutional purposes.

2.2 Models of Organizational Culture

Public institutions must take into account an organizational culture that allows them to face the challenges and adapt to the changes, in such a way that the objectives are achieved. So it is important for institutions to acquire knowledge of the type of culture and characteristics that predominate within them, allowing them to improve the performance of public servants.

The management has two perspectives that are part of the organizational culture approach. The performance-oriented perspective - processes and the human-oriented perspective - values (Aktouf, 2002; Morcillo, 2006; Nikandrou, et. al., 2008).

On the one hand, performance orientation is the degree to which an organization encourages and rewards the members of the group in order to achieve high standards, better performance and operational excellence. This approach sees culture as a tool to encourage commitment and achieve objectives (House et al., 2004; Soemaryani and Rakhmadini, 2013). On the other hand, the orientation to the human being is the degree to which an organization encourages and rewards the members of the group for their way of being and good treatment towards others. Corporate values are proposed by the organization and are aligned with the personal values of the members of the organization (Qubein, 1999; House, et al., 2004). The following is a summary of some models related to these approaches.

Schein (1990) defined the main characteristics of the existing culture in an organization, distinguishing three levels: artifacts, values and assumptions:

- *Artifacts:* This level is constituted by architecture, technology, communication, clothing, among others. At this level, the analysis is difficult, because the data are easy to obtain but difficult to interpret.
- *Values:* Basically refer to the beliefs of the working group that are established from the values that exist in the organization, which determine whether the culture contributes or hinders the achievement of goals and objectives.
- *Assumptions:* This level describes how individuals in the organization think they feel and act. It is composed of five dimensions: the relationship of the organization with the environment, the nature of reality and truth, human nature, the nature of human activity and the nature of human relationships. This model has limitations in the connections between artifacts, values and cultural assumptions.

Hatch (1993) makes reference to the model of Schein (1984), and in turn introduces a new element to this model: the symbols along with the symbolic-interpretative approach. It also describes as processes the relationships between cultural elements (artifacts, values, assumptions and symbols); in this way, it demonstrates that these cultural elements are related in a dynamic and circular

process in the two moments of culture: stability and change. The model tries to articulate the processes of exposure, performance, representation and interpretation, and argues that none of these processes can be sustained in isolation.

Trompenaars and Wooliams (2003) define that the culture in an organization is modeled not only by the technologies and markets that influence it, but also by the cultural preferences of leaders and employees. There are three aspects of the organizational culture: the general relations between the employees and the organization, the system of hierarchical authority that determines the superiors and subordinates, and the general views of the employees about the destiny of the organization, its purposes and its goals. . This model has two dimensions that allow to distinguish the organizational culture, which generates four quadrants: equality - hierarchy and orientation to the person - orientation to the task. Four types of organizational culture are also defined, which vary considerably regarding the ways of thinking, learning, motivating, resolving conflicts and rewarding. This categorization helps organizational analysis, but it also has the risk of typifying or stereotyping to simplify something that is complex. The four types of organizational culture are the family, the Eiffel Tower, the guided missile and the incubator.

Cameron and Quinn (2011) proposed a methodology based on the Competency Values Framework model. The purpose of this model is to diagnose the culture of an organization and facilitate the change of it. The same ones that identified four types of dominant cultures: clan, adhocracy, hierarchical, and market. In this type of culture the organization is oriented to the results, worrying about doing a well done job. People are competitive, leaders are demanding and competitive in turn. Competitiveness and productivity in market-oriented organizations are achieved through a strong emphasis on market participation, positioning and control. The model also shows if the organization has predominant characteristics in terms of the degree of flexibility facing environmental changes on the part of its members; or if in its case the organization is oriented towards stability and control while facing changes.

The proposed models refer to an organizational culture aimed at performance, cultural changes, technologies, which has allowed private and public companies to improve their processes. So it is necessary to indicate that they have dimensions according to the environment where they are developed. However, they have limitations in terms of methodology, instruments for diagnosis, levels at which culture manifests, that is, management is not considered, it is only based on models of organizational culture.

3 MANAGEMENT OF ORGANIZATIONAL CULTURE IN PUBLIC INSTITUTIONS OF THE EDUCATIONAL SECTOR

The organizational culture within the institutions is an important aspect according to the management that is developed, which integrates the actors for a better functioning of these institutions. The management is related to the administration and transformation of the processes based on the policies, norms, values, which will allow the strengthening and development of the same.

North (1990) defines *institutions* as the rules of the game that shape human interaction in a society. The components of institutions, the rule and the imposition or sanction, to define institutions as the rules commonly known to structure repetitive interaction situations followed by a mechanism of application and sanction that ensures that the failure to comply with the rules component is sanctioned, are studied by some authors, included Aira (2016). The function of institutions is to reduce uncertainty through important elements such as securing property and rights contracts. Institutions provide the structures to define and limit the set of choices of individuals, reducing uncertainty by regulating a legal environment of property rights, the establishment of social conventions and norms, the concern for economic development centered on institutional development.

To establish the difference between an institutional order and an organizational order, Dove (2001) argued that both institutions and organizations are made by humanity. But they have a totally different nature, and they require different mental processes to study, understand and change them. Organizations are components of the social order, while institutions are that order. Institutions are abstract entities, and their purpose is to facilitate exchanges between organizations or individuals, allowing them to realize specific objectives. That is, institutions are like the rules of the game that organizations are playing.

The most developed societies have generated their own conditions for the institutional transformation that implies the structuring rules of collective action, mental models, values, attitudes and capacities, and balances of power. This can only result from the social learning process which usually can only happen incrementally. The correlations on which the institutional transformation depends are too complex to permit its valid planning. It is this complexity that not only makes the temporary programming of changes very difficult but also will almost inevitably produce unintended transformations and unforeseen effects. The institutional transformation and unforeseen effects. Institutional transformation can not be the fruit of human will alone, as the constructivist instrumental rationalism continues to pretend (García, 2015). In case of universities, the change must occur in the face of quality models demands and the changing needs for customers (Alvarado and Barba, 2016).

Change and institutional transformation modify the character and integrity of organizations. The institutions are the set of norms, policies that are related to the forms of interaction of the actors and of the organizations that make up a political

system, so the changes are related to the norms that condition the forms of access to power and the relations of citizens with the rulers.

Calero (2005) expressed that *institution* is the articulated set of actions of conduction of an educative center to be carried out with the purpose of achieving the objectives contemplated in the institutional educational project.

The public institutions of the education sector in Ecuador must be able to promote values that allow demonstrating a good performance according to the activities developed by public servants, so that there is a change and transformation of them must apply the rules and policies that govern in the entities, for what is generated a management of organizational culture that transmits a sense of union between the members of those institution. The above will be linked to other organizational measures that should be taken to improve efficiency and effectiveness parameters in management (Flores, et al., 2014).

Regarding the concept of institution Meza (2007) indicated that it is remarkable how the expression can become general, if one considers that companies are also focused on the public, that is, on people. However, in the middle, we try to differentiate it from what is a company, more by its origin and purpose, because in these cases both have certain differences. While the company seeks profit and obtain maximum economic gain through the production of goods or services for the general public or its customers; the institutions try to provide a good or service to the general public, without profit motive and, primarily, because they are part of a state, to satisfy the needs of the people.

Based on the various definitions that have been revised about *institution*, it can be indicated that they are applicable to public institutions according to the following reasons:

1. Set of functional dependencies that constitute the public sector is an organization, and therefore, can be approached for study from the theories of administration.
2. As an organization, it is characterized by the following structural components: mission, culture, government, administration and financing.
3. All groups of people who meet with some objective, define certain uses and customs and institutionalize criteria on what is acceptable and unacceptable. The set of these elements configures mental models, concepts, habits and forms of relationship that can be summarized in the category of analysis: organizational culture

In a general way it can be said that the organizational culture influences an institution basically on:

1. the behaviors of human beings;
2. commitment to the institution;
3. the work of the institution, performed invisibly on the methods and techniques of managing the organizational culture;
4. how to deal with problems and how to provide solutions;
5. the appreciation of the institutional context by those involved;
6. attitude towards changes.

It is necessary to understand the high level of impact and the influence that the organizational culture has on the institutions, it is necessary to clarify the meaning of the set of analytical qualities that has been used.

Felcman, Blutman and Méndez (2001) consider that culture is composed of elements and manifestations both visible and conscious as invisible and unconscious, including within the organizational culture those related to labor values, cultural types and basic assumptions.

From the above, it can be concluded that organizational culture is essential within public institutions because it involves society, recognizing a dynamic learning process according to values, beliefs, rules, procedures, language, ritual and ceremonies, which strengthens relations between public servants and community. The culture determines the way an organization performs, it is reflected in the strategies, structures, methods and systems according to what is established by each institution.

4 MANAGEMENT IN THE PUBLIC INSTITUTIONS OF THE ECUADOR EDUCATIONAL SECTOR

The Constitution of the Republic of Ecuador (2008) in Article 227 states that "Public Administration constitutes a service to the community that is governed by the principles of effectiveness, efficiency, quality, hierarchy, decentralization, coordination, participation, planning, transparency and evaluation", it also establishes the Technical Standard of Restructuring of Institutional Public Management (Ecuador, 2011). Under this approach, the success and organizational vitality of institutions depend on the development of appropriate cultures and values that contribute to new forms of administration and organization.

Under the previous legal framework, most of the processes were concentrated in the central building of the Ministry of Education, which made it very difficult to provide timely responses to local needs throughout the country. In the new legal framework, it is defined that the National Educational Authority is made up of

four levels of management: one of a central nature and three of deconcentrated management, which correspond to the zonal, district and circuit levels (Article 25 of Organic Law on Education and Interculturality). In this context, "deconcentration" means that the central level retains the power to create public policies, but that deconcentrated levels are in charge of implementing them. By decentralizing the management of the Ministry, two main objectives are achieved:

1. The attention of the State is brought closer to citizens, which ensures, in a timely and strategic manner, greater agility, efficiency and effectiveness in educational services.
2. The educational offer is rationalized and reorganized to guarantee complete and relevant educational services in each circuit. All this also allows to achieve greater transparency for all processes.

The new educational legal framework establishes that education is a necessary condition for equal opportunities and to achieve the Good Living society. In this sense, education is conceptualized once again, which can no longer be a privilege of a few, but "a right of people throughout their life" and therefore "an inescapable and inexcusable duty of the State", and "a priority area of public policy and state investment" (Article 26 of the Constitution). From all of the above it is inferred that education must respond "to the public interest" and must not be "at the service of individual and corporate interests" (Article 28 of the Constitution).

The Republic of Ecuador within its current regulations contemplates the following axes:

- Restoration and rationalization of the institutional structure of the Executive Function.
- Development of new management models of public institutions for the provision of services to clients.
- Deconcentration and decentralization of the State, both in the analysis and definition of the areas of action of state institutions, and in the rethinking of the mechanisms, processes and procedures through which public actions are carried out, the relationship with the Territories and the functional differentiation between institutions must be concretized in localized public interventions and in new state institutions in the territories.

The main purpose of public administration is to change the attitudes of actors responsible for the management of the public, political agents, public servants, community and social leaders. The trend to the client, corporatism and dependency are predominant features of the mentality of the bureaucracy of the last century that must be fought; and that are the result of a history of centralism,

dependence, patrimonial patterns and client trends, far from a just and self-sustainable development project for which the country has bet.

The public administration seeks to increase the ethical values of public servants, encouraging behaviors that are directed to carry out their work with the best willingness to serve, to use rationally and economically the resources of the State, to seek the highest efficiency and quality in their work, to improve their own professional competence, to practice good faith in their relationship with citizens and to help create a good working environment.

In general, the need for Ecuadorian public universities to raise the management level, based on fundamental aspects of the quality approach for internal and external clients (Cárdenas, 2016), which will allow them to reach international standards. This analysis has generally focused on value-adding processes, such as the training of professionals and research (Véliz, Quindemil and Rumbaut, 2015). At the same time, it is recognized as a challenge that, in these aspirations, the organizational culture allows to reach the expected levels in the "academic and administrative quality of public university" (García, et al., 2014).

5 CONCLUSION

The organizational culture within the public institutions of the education sector influences their values, behaviors, policies, norms, which allows improving the behavior of public employees.

The organizational culture management models reported in the literature are basically oriented to private and public business sector, which are not easily adaptable to the education sector.

Ecuador and its policies developed for public educational institutions do not refer to the management of organizational culture, which causes the dismantling of the planning, organization, execution and control processes that are carried out within them.

There are no reference to management models of organizational culture oriented to provide services in education sector, so it would be novel to design and implement a model of this type in the Republic of Ecuador.

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A Comparative Study on Satisfaction with Current Standard of Living and its Effects on Overall Life Satisfaction: Case of Romania, V4 and EU-15

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ABSTRACT

Purpose: The main aim of the paper is to explore the patterns of differences in overall life satisfaction in Romania and the V4 in comparison to the EU-15.

Methodology/Approach: We carried out contingence analysis and linear regression analysis in order to assess the impact of income and satisfaction with current standard of living on overall life satisfaction.

Findings: The main novelty of our research, which presents a significant contribution to the body of knowledge, is that we found that life satisfaction of citizens increases with income category, but there is a more relevant relationship between subjective life satisfaction and subjective self-reported satisfaction.

Research Limitation/implication: Despite several limitations of our research (data from the third wave of EQOLS, restricted number of determinants of life satisfaction, absence of effects of financial crisis), we can say that material living conditions and satisfaction with current standard of living still play an important role in life satisfaction of the citizens and the well-being of nations.

Originality/Value of paper: The paper focuses on the importance of material living conditions and satisfaction with current standard of living in overall life satisfaction to explore the patterns of differences of life satisfaction in selected countries, and that results are useful for policymakers.

Category: Research paper

Keywords: satisfaction; income; standard of living; quality of life; Romania; Visegrad Group countries

1 INTRODUCTION

Quality of life (QOL) represents a complex, multi-dimensional and interdisciplinary concept, for which no uniform, universally accepted definition exists (Apparicio, Seguin and Naud, 2008; Das, 2008; Royuela, Moreno and Vayá, 2009; Ulengin, Ulengin and Guvenc, 2001).

According to Fayers and Machin (2013), QOL reflects the difference between the hopes and expectations of the individual and of the individual's present experience.

In the process of QOL assessment, the important parts are the precise definition of the explored area and the appropriate selection of suitable indicators (Murgaš, 2009; Řepková and Stavárek, 2014; Gavurová, 2012).

QOL stands for a broader concept than economics, industry and living conditions. It includes a number of factors affecting our evaluation of life above its material page. In Report of the commission on the measurement of economic performance at social progress (Stiglitz, Sen and Fitoussi, 2009), there is a distinction between three approaches of QOL measuring. The first approach is closely connected to psychological research and focuses on the subjective evaluation of well-being. The second approach considers human life in terms of various deeds and beings and individual freedom to choose between these individual abilities. The third approach was developed in the context of the economic tradition and has its basis on fair allocation.

Besides the term QOL, there are various interrelated terms that are often used as synonyms, although their meaning is not yet precisely defined, e.g. life satisfaction, happiness, subjective well-being, well-being etc. According to Diener (2005), subjective well-being represents all of the various types of evaluations, both positive and negative, that people make of their lives. Life satisfaction is a respondent's evaluation of his/her life taken as a whole. On the other hand, domain satisfactions are judgments of people made by evaluating major life domains such as living standard, health, job, leisure time, social relationships and family. Veenhoven (1996) describes happiness as a person's overall evaluation of his life as a whole. Deaton (2008) distinguishes between terms of life satisfaction and happiness.

Respondents are asked questions about life satisfaction in order to give them the chance to make an overall evaluation of their lives. The results are often interpreted as measures of happiness, but happiness can also be thought of as relating to affect, and can be measured from experiential questions (e.g. about smiling a lot or feeling happy or absence of depression, often during the day before the interview).

QOL has been investigated from different aspects that imply its multidimensional character (e.g. Khaef and Zebardast, 2016; Eby, Kitchen and Williams, 2012). In Eurostat report (2011) a development of multidimensional indicators is recommended.

2 LITERATURE REVIEW

The importance of different life circumstances in shaping the overall satisfaction of life has been the subject of different research studies. Economists are interested in the role of income as a gain to the individual life satisfaction. Evidence in time series data for developed countries, transition countries, and less developed countries confirms that short term fluctuations in happiness and income are positively associated but long term trends in happiness and income are not related (Easterlin, 2013). These results suggest only little or no long-term interrelation between national income and people's average level of life satisfaction. Another research study in the USA and UK has confirmed a small impact of income on life satisfaction in relation to other life circumstances such as age, sex or racial group (Blanchflower and Oswald, 2004). Further, a correlation between country average levels of life satisfaction and the Gini coefficient, the most common measure of income inequality, (Eurofound, 2015) was not confirmed.

On the other hand, Deaton (2008) considers income and health as the most important factors which enable people to lead a good life. He also claims that health alone does little to enable people to lead a good life. Other factors (e.g. education or participation in society) are also important determinants, but evaluations of income and health incline to get primary attention in most assessment of human well-being. Some research studies prove the fact that the higher the level of economic development and wealth of a country, the weaker its impact on reported satisfaction (e.g. Frey and Stutzer, 2001; Veenhoven, 2005).

Another research in this area identifies that people in wealthier countries are more satisfied with their material conditions or with life as a whole and this life satisfaction is more significantly affected also by other objective conditions in poor countries (Schyns, 2002). Based on Zagórski, Kelley and Evans (2011), poor people are usually more satisfied in wealthy societies than they are in poor societies, and consequently wealthy people are happier in poor societies than in rich societies. These relations pertain to material conditions, as well as other domains, such as education, health or job. Another important aspect when talking about satisfaction with life and satisfaction with material living conditions is the process of modernization and post-modernization (Inglehart, 1997; Inglehart and Welzel, 2005). Inglehart's theory is based on the diminishing impact of material living conditions on life satisfaction at higher levels of human and social development. In post-modern societies, changes of value system have been observed. Needs of a higher order concerning self-realization and self-expression have become more important for individuals and society. Because of the fact that in the most developed societies, material needs are more regularly satisfied, the satisfaction of these needs and further accumulation of material goods do not increase the feeling of happiness and other needs become more important. In other words, for wealthy people satisfaction with basic material needs is less important than that of poor people. Consequently, the same increase in material standard of living satisfies the poor more than the wealthy.

Wiese (2014) tested the impact and the importance of GDP on the well-being of citizens in the European countries. He found important differences in connection with life satisfaction and the deviation from trend growth among certain countries (Spain, Italy, Portugal and Greece) and confirmed that some characteristics of their welfare state might determine their citizens to be more dependent on certain economic variables such as rising income.

Zagórski (2011) examined the relations between income and happiness change in Poland in a way that is consistent with Inglehart's modernization theory. He also assessed the impact of income and modernization on satisfaction with income and life as a whole by regression equations. Various research studies investigated the relationship between income and life satisfaction (Cummins, 1998; Diener and Fujita, 1995; Deaton, 2008; Havasi, 2013).

3 DATA AND RESEARCH METHODOLOGY

We ran our analysis on data from Eurofound database (Eurofound, 2015) which includes data obtained from the third wave of QOL surveys in the EU (European Quality of Life Surveys - EQOLS, 2012). Data were collected individually for each citizen who replied to the questionnaire, available through the UK Data Service, and for each country available on interactive database on the website of Eurofound. Concretely, we used data about satisfaction with different areas of life (education, current standard of living, accommodation, family life, health, social life, economic situation in country and overall life satisfaction) and data about household income in EUR. Households were divided into 22 income categories from the lowest monthly income (less than 50 EUR) to the highest monthly income (5.500 EUR and more). Questions from European Quality of Life Surveys (EQOLS) conducted in 2012 were put to people about their subjective perception of satisfaction with life as a whole and also satisfaction with partial areas of life (e.g. health, present standard of living). People in the Eurofound questionnaire evaluated their satisfaction with life and with partial life areas in the scale from 1 to 10, which refers from "I am very dissatisfied to I am very satisfied".

We used the contingence analysis as a method to find satisfaction patterns with current standard of living and income among citizens in the context of overall life satisfaction. Influence of different satisfaction elements on overall life satisfaction in Romania, the V4 and the EU-15 countries was tested by the means of multiple linear regression analysis conducted in statistical software R. A similar approach to linear regression models was used in various studies (e.g. Deaton, 2008; Saksonova and Vilerts, 2015; Havasi, 2013; Drule, et al., 2014).

Our linear regression model was estimated as a QLS regression by means of the next formula:

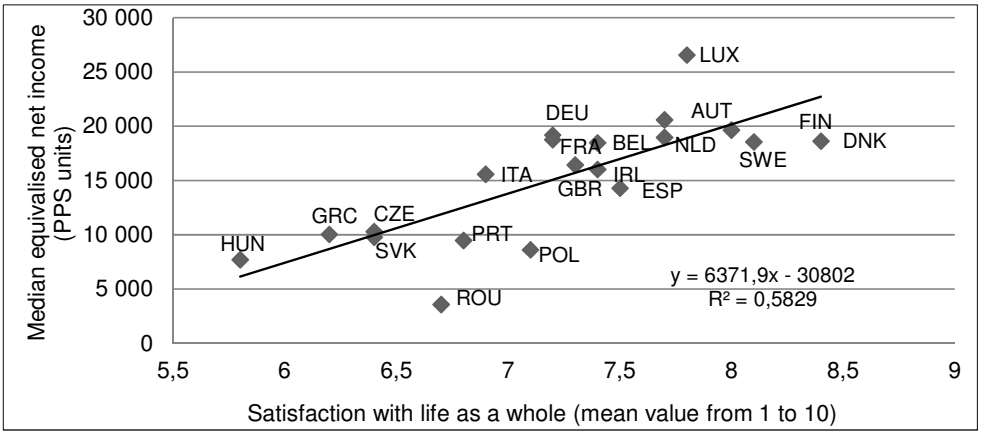
$$Y = \beta_0 + \beta_1 X_1 + ... \beta_n X_n + \varepsilon \,, \qquad (1)$$

where Y is the dependent variable - overall satisfaction with life, defined on the scale from 1 to 10, which refers from very dissatisfied to very satisfied; β_0 is the intercept term; X_i is a vector which consists of various variables that affect satisfaction with life, partial satisfaction with different life domains defined on the scale from 1 to 10; β_n are the n coefficients for independent variables, the vector of coefficients shows the impact of the previously mentioned variables on overall life satisfaction; ε is the error term.

Estimation was done in both the classic and the standardized versions. Standardized regression enables us to order the factorial variables in accordance with their impact on each variable on the dependent variable.

4 RESULTS AND DISCUSSIONS

Modernisation of Romania and the V4 and the consequential improvement in material conditions influence the relations between material living conditions and satisfaction with them and with life in general. At the beginning, we focused on connections between the level of material living conditions and the overall life satisfaction within countries and also between countries. Our calculations confirmed that richer people are more satisfied with life and also people of richer nations are more satisfied too.



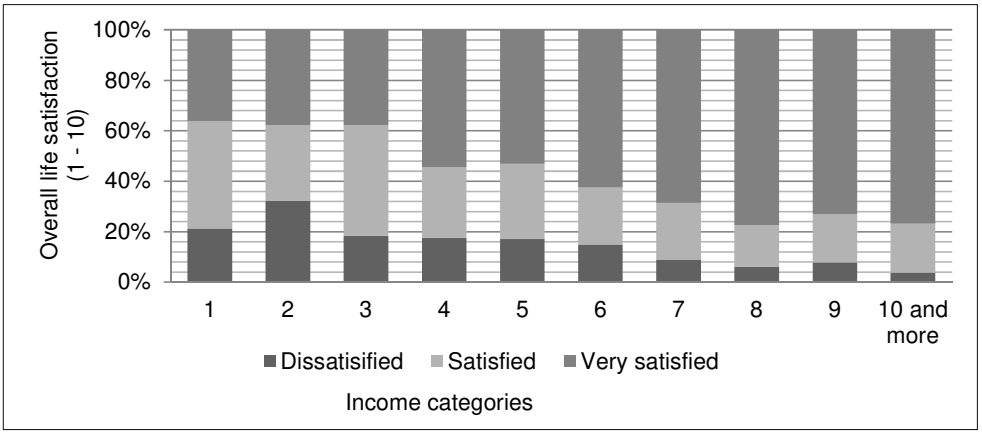
Notes: 3 Letter ISO Codes: Austria-AUT, Belgium-BEL, Czech Republic-CZE, Denmark-DNK, Finland-FIN, France-FRA, Germany-DEU, Greece-GRC, Hungary-HUN, Ireland-IRL, Italy-ITA, Luxembourg-LUX, Netherlands-NLD, Poland-POL, Portugal-PRT, Romania-ROU, Slovakia-SVK, Spain-ESP, Sweden-SWE, United Kingdom-GBR, PPS-purchasing power standard units.

Figure 1 – Relationship Between Median Equivalised Net Income and Satisfaction with Life as a Whole In Romania, the V4 and the EU-15 Countries (2012)

Fig. 1 reflects on the relationship between the objective indicator of material living conditions - median equivalised net income measured in PPS (Eurostat, 2015) and subjective life satisfaction expressed in mean value (scale from 1 to 10). As we can see from the graph, mean life satisfaction is higher in countries with higher values of median equivalised net income. Value of correlation coefficient between income and subjective life satisfaction of citizens is 0.763, which means that there is a strong positive relationship between them and thus confirms our expectations. The EU-15 countries are situated in the top right part of the figure because of higher values of income and life satisfaction, except for Greece and Portugal, which have the lowest level of income out of the EU-15. Romania and the V4 countries are situated on the bottom left part of the figure with considerably lower values of income and satisfaction. Poland and Romania are situated below the linear regression curve with higher values of life satisfaction in relation to income. For example, citizens of Romania report similar level of life satisfaction as citizens of Portugal in spite of different levels of income. In other words, people in Romania are more satisfied with life in general according to the level of country's income. With income expressed as a log, the relationship is close to linear and the value of correlation coefficient is 0.707.

The next graph (Fig. 2) points to the level of overall life satisfaction in households in Romania divided according to their income categories. In each income category we can see percentage of households according to their level of overall life satisfaction on the scale from 1 to 10. We labelled households which denoted their satisfaction with life on the scale from 1 to 3 as "dissatisfied", from 4 to 6 as "satisfied" and from 7 to 10 as "very satisfied". We analyzed a number of 1,315 households.

We can conclude that the percentage of very satisfied households is rising closely connected to the income category. On the other hand, the percentage of satisfied people is relatively high also in the lowest income category. We can consider the fact that overall life satisfaction of people in Romania is shaped also by other dimensions of life, though income plays an important role.



Notes: Income categories (monthly income): 1- Less than €50; 2- €50 to €99; 3- €100 to €149; 4- €150 to €199; 5- € 200 to €249; 6- €250 to €349, 7- € 350 to €449; 8- €450 to €599; 9- €600 to €749; 10- € 750 to € 899; 11- € 900 to €1.124; 12- €1.125 to € 1.349; 13- €1.350 to €1.649; 14- €1.650 to €1.949; 15- €1.950 to €2.249; 16- €2.250 to € 2.699; 17- €2.700 to €3.149; 18- €3.150 to €3.599; 19- €3.600 to €4.049; 20- €4.050 to €4.499; 21- €4.500 to €5.499; 22- €5.500 or more.

Figure 2 – Percentage of People Who Are Satisfied with Their Life as a Whole Within Income Categories in Romania (2012) (Source: Calculations of the Authors Based on Data from Eurofound)

Next, we compared the results of contingence analysis between Romania, the V4 and the EU-15 to explore relations and differences between income categories, categories of self-reported satisfaction with current standard of living and overall life satisfaction within countries in more detail.

Table 1 – Percentage of People Who Are Satisfied with Their Lives as a Whole (7-10) within Income Categories (Source: Calculations of the Authors)

	Very Poor						**Very Wealth**
	1-3	**4-6**	**7-9**	**10-12**	**13-15**	**16-18**	**19-22**
Romania	37.3	56.6	73.0	80.5	75.6	75.0	100.0
V4	51.2	41.0	47.7	64.5	72.1	86.9	65.0
EU-15	63.0	55.6	51.5	63.7	74.2	82.1	89.3

We can experience that the percentage of people who scored their satisfaction with life as a whole on the 10-point satisfaction scale from 6 to10 (very satisfied) within income categories increases, but not in all categories (see Tab. 1). Differences exist between countries mainly due to income distribution. In Romania the most people belong to the first twelfth income categories in which we can see trend of growth of very satisfied people, but with a diminishing pace. On the other hand, the V4 countries confirm the growth trend from the sixth category and the EU-15 from the seventh category. When we consider relationship between self-reported satisfaction with current standard of living and

overall life satisfaction (Tab. 2), percentage of very satisfied people increases almost within all satisfaction categories. It was also confirmed that there is a more obvious relationship between subjective life satisfaction and subjective self-reported satisfaction with current standard of living than between subjective life satisfaction and income itself. This finding corresponds with results of Havasi (2013).

Table 2 – Percentage of People Who Are Satisfied with Their Lives as a Whole (7- 10) within the Categories of Self-Reported Satisfaction with Present Standard of Living (Source: Calculations of the Authors)

	Very Dissatisfied									**Very Satisfied**
Romania	11	20	21	31	36	50	77	89	88	87
V4	16	19	20	32	39	51	75	82	90	88
EU-15	19	20	27	31	46	58	78	88	93	92

Then, we explored the importance of self-reported satisfaction with current standard of living in overall life satisfaction, separately for Romania, the V4 and the EU-15. We can quantify contribution of this partial satisfaction to the overall life satisfaction by means of multiple linear regression models in which dependent variable is overall life satisfaction and 7 independent variables are partial satisfactions with various dimensions of life, scored from 1 to 10. The aim of the econometric models was to identify the significance of the impact of partial satisfaction with different life dimensions on overall life satisfaction.

Firstly, we calculated linear regression model for people in Romania on data from the third wave of EQOLS (2012). Linear model shows the significant influence almost in all life dimensions on overall life satisfaction except for satisfaction with education, accommodation and social life. Values of coefficients can be interpreted as follows, e.g. when satisfaction with current standard of living increases by one unit, measure of life satisfaction will increase by 0.47 units. The highest positive effect on overall life satisfaction based on values of regression coefficients was recognised in satisfaction with current standard of living, followed by family life and health. This finding can confirm our assumptions that satisfaction with current standard of living is the most important factor in determining life satisfaction in Romania.

Table 3 – Multiple Linear Regression Model for Life Satisfaction in Romania (Source: Calculations of the Authors)

	Coefficients		**Standard Error**	**t-value**	**Pr (> |t|)**
	Classic	**Standardized**			
Intercept	1.32203	-	0.25560	5.172	< 0.001 ***
Education	0.02065	0.01625552	0.02787	0.741	0.4587

	Coefficients		Standard Error	t-value	Pr (> |t|)
	Classic	Standardized			
Current standard of living	0.47488	0.50469037	0.02536	18.722	< 0.001 ***
Accommodation	-0.02897	-0.02591020	0.02793	-1.037	0.2999
Family life	0.15848	0.14333598	0.02780	5.700	< 0.001 ***
Health	0.08763	0.09722058	0.02173	4.032	< 0.001 ***
Social life	0.03869	0.03700074	0.02789	1.387	0.1656
Economic situation	0.05792	0.05285615	0.02293	2.526	0.0116 *

Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Adjusted R-squared: 0.4442, number of observations = 1445, F-statistic: 165.9, p-value: < 0.001.

Secondly, we calculated linear regression model for people in the V4. Linear model shows the significant influence almost in all life dimensions on overall life satisfaction except for satisfaction with education and accommodation. The highest positive effect on overall life satisfaction based on values of regression coefficients was recognised in satisfaction with present standard of living, followed by family life and economic situation. The influence of partial satisfaction with current standard of living is less significant in comparison to Romania (lower absolute value of coefficient).

Table 4 – Multiple Linear Regression Model for Life Satisfactions in the V4 (Source: Calculations of the Authors)

	Coefficients		Standard Error	t-value	Pr (> |t|)
	Classic	Standardized			
Intercept	2.212730	-	0.104846	21.105	< 0.001 ***
Education	0.001314	0.001505923	0.011424	0.115	0.908
Current standard of living	0.380034	0.412777087	0.014685	25.878	< 0.001 ***
Accommodation	-0.010211	-0.010900390	0.014165	-0.721	0.471
Family life	0.108972	0.114203311	0.014100	7.728	< 0.001 ***
Health	0.063304	0.074541347	0.011844	5.345	< 0.001 ***
Social life	0.075498	0.081306042	0.014022	5.384	< 0.001 ***
Economic situation	0.097818	0.097325164	0.012467	7.846	< 0.001 ***

Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Adjusted R-squared: 0.3524, number of observations = 4964, F-statistic: 408.9, p-value: < 0.001. V4: The Czech Republic, Hungary, Poland and Slovakia.

Finally, we compared our results to multiple linear regression model calculated in the EU-15 countries to find differences between Romania, the V4 and the older members of the EU, the 15 more developed countries in Europe.

Table 5 – Multiple Linear Regression Model for Life Satisfaction in the EU-15 (Source: Calculations of the Authors)

	Coefficients		Standard Error	t-value	Pr (> |t|)
	Classic	Standardized			
Intercept	1.466183	-	0.059571	24.612	< 0.001 ***
Education	0.004143	0.004668565	0.005384	0.770	0.442
Current standard of living	0.338913	0.350259497	0.007415	45.705	< 0.001 ***
Accommodation	0.034160	0.032559770	0.007401	4.615	< 0.001 ***
Family life	0.153671	0.146940027	0.007174	21.421	< 0.001 ***
Health	0.067434	0.074031872	0.005803	11.621	< 0.001 ***
Social life	0.149511	0.145786011	0.007377	20.268	< 0.001 ***
Economic situation	0.066153	0.080111672	0.004803	13.773	< 0.001 ***

Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Adjusted R-squared: 0.395, number of observations = 20620, F-statistic: 1924, p-value: < 0.001. EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

By examining the results of the EU-15 model, we found the significant influence almost of all life dimensions on overall life satisfaction except for satisfaction with education. Influence of satisfaction with current standard of living on overall life satisfaction is the smallest out of all calculated models (value of coefficient is the lowest). We can state that importance of this partial satisfaction is the weakest for citizens of the EU-15. On the other hand, value of coefficient for satisfaction with social life almost doubled compared to the V4. Linear model shows the positive significant influence of satisfaction with accommodation, in comparison to Romania and the V4 model, where coefficients were not significant.

5 CONCLUSIONS

This paper focuses on the importance of material living conditions and satisfaction with current standard of living on overall life satisfaction, in order to explore the patterns of differences of life satisfaction in Romania and the V4 countries in comparison to more developed EU-15 countries.

At the beginning, we explored the positive relationship between the objective indicator of material living conditions (median equivalised net income) and mean subjective life satisfaction. Our calculations confirm that richer people are more satisfied with life and also people of richer nations are more satisfied. It can be stated that despite the diminishing importance of material and living conditions in the value system of post-material societies (Inglehart and Welzel, 2005) they are still important in life satisfaction of the EU citizens. Our results correspond to

Deaton (2008) who confirmed that the level of national income is an important positive determinant of life satisfaction and the rate of growth of income is a negative determinant for each of the age groups. On the other hand, some research studies argument that there are no or only weak positive relationship between life satisfaction and the level of economic development measured e.g. by GDP per capita or national income (e.g. Eurofound, 2012).

According to the contingence analysis, we found that overall life satisfaction of citizens increases with income category, but there is a more obvious relationship between subjective life satisfaction and subjective self-reported satisfaction with current standard of living than between subjective life satisfaction and income itself. Moreover, there are differences between countries mainly due to income distribution.

We tested our assumptions by linear regression models calculated separately for Romania, the V4 and the EU-15. The values of regression coefficients confirmed that satisfaction with present standard of living had the highest positive effect on overall life satisfaction from all partial satisfaction elements. However, importance of this partial satisfaction was the weakest for citizens of the EU-15. In our analysis we have to take into consideration the process of the transformation from centrally planned to modern free market democracy and level of post-materialist value orientation of Romania and the V4 citizens. We can say that material living conditions are less important for the citizens of EU-15 with more postmaterialist values. This finding is in accordance with Havasi (2013) who conducted multiple regression analyses that indicated differences between the EU countries in the magnitude of the effects of material conditions on subjective well-being. His findings confirm that this effect is smaller in the more postmaterialist countries. Despite the fact that Romania and the V4 have recorded obvious socio-economic progress, more than nine years after the EU accession we can say that they belong to the EU as less economic and social developed countries. These and many other factors can have an influence on value system of the citizens. According to Zagórski (2011), the post-modern period involves a process of decreasing importance of income and material living conditions in shaping life satisfaction. This does not mean that material conditions have become irrelevant; but their impact on happiness has decreased.

In spite of positive relationship between life satisfaction and income indicator, measure of life satisfaction cannot be considered as a reliable indicator of people's well-being, mainly because it does not sufficiently reflect objective circumstances of life. Even though there is a controversial debate about this relationship, Deaton (2008) argues that overall life satisfaction and partial life satisfaction elements are direct measures of the important aspects of human experience and therefore scientists and policy makers should better understand their meaning, relevance in the research and relationships between them and other objective measures (e.g. income, GDP per capita). Another important aspect which can affect life satisfaction is insecurity of future and fear of losing desired standard of living (Ekici and Koydemir, 2016). Some social groups (e.g.

retired) can be more vulnerable than others (Eurofound, 2012). Therefore, deeper analysis of different social groups within countries can be useful.

Despite several limitations of our research (data from the third wave of EQOLS, restricted number of determinants of life satisfaction, absence of effects of financial crisis), we can say that material living conditions and satisfaction with current standard of living still play an important role in life satisfaction of citizens and the well-being of nations. Although material living conditions and economic development are important parts of social progress, new indicators have been recognized in accordance with the concept of sustainable development and respect for environmental limits (e.g. gross national happiness, happy planet index). Every process of economic growth should be explored also in terms of sustainability whether this growth is not injurious towards the public and the environment.

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Improving Information Flow for Decision Making on Product Quality in the Automotive Industry

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ABSTRACT

Purpose: The purpose of the paper is to identify improvement possibilities in the data processing and information flow relating to product quality in the processes of automotive component production, which might result in the acceleration of decision making on product quality and reduction of defects and related costs. The expected results of the proposed improvement are presented in the paper.

Methodology/Approach: Modelling and simulations of the component production processes with the current and proposed state of information flow were made in the QPR software to test the effect of the changes in the information flows. Subsequently, the results of the simulations of both process models were compared from the perspective of quality.

Findings: Results of the simulations showed the positive effect of the proposed changes reflecting in the lower number of defects compared to the current state. Based on the accurate and timely received information on product quality, needed interventions to the process can be realized to reduce the defects.

Research Limitation/implication: The limitation of the paper is the exact estimation of benefits after the improvement implementation. The expected benefits were defined on the base of test operation.

Originality/Value of paper: The originality of the paper is in the applicability of the proposed solution in organisations operating in the automotive industry or other data-driven manufacturing organisations calling for timely and accurate information access to achieve a high level of quality, effectiveness and efficiency in the production processes.

Category: Research paper

Keywords: information; information flow; product quality; decision making; process modelling

1 INTRODUCTION

Decisions in organizations are made at all hierarchical levels. Factual approach to decision making plays an important role in quality management in organisations. Fact-based decision making according to (ISO, 2015) considerably emphasises data and information analysis as a basis for decision making rather than just subjective opinion (Nenadál, et al., 2008). The need of facts for objective decision making is also highlighted by the words of Edward Deming: "Without data you're just another person with an opinion" (Anderson, 2015).

Effective data collection is a first step in the implementation of the factual approach to decision making. Data must be accessible, accurate and reliable and transferred on the base of a query by using appropriate tools to needed information (Anderson, 2015). Information is a meaningful data or interpretation of data (Wang, 2015). The information comes from selecting data, summarising it and presenting it in such a way that it is useful to the recipient (Hinton, 2011). Optimally designed information flow makes information accessible to those who need it. Information flow in organisation is timely, relevant and appropriate flow of information from a sender (transmitter) at point A to a receiver (recipient) at point B (Durugbo, Tiwari and Alcock, 2013). Information flow is a lifeblood of the organisation ensuring the needed information is available for relevant organisation processes, activities and people. According to (Durugbo, Tiwari and Alcock, 2010) information flow is determined by main three dimensions: information access, information exchange and documentation (Berente, Vandenbosch and Aubert, 2009). The focus of the paper is on the information access in order to support decision making, which relates to the presence of the information and the ease with which the information can be retrieved.

There are various Management support systems used in organisations to ensure the needed information are delivered to all managers (from strategic to operational level) for effective execution of management functions. Management support systems can be divided according to their use in organization's management levels as follows (Anderson, 2015): Executive Information Systems (EIS) – serves for top management; Decision Support Systems (DSS) – serves for middle-level management and Management information systems (MIS) – serves for low-level and middle-level management. Mostly the term Management Information System (MIS) is used in the literature as an umbrella of the above-mentioned support systems. The MISs convert data into information and communicate that information in an appropriate form to managers at all levels to make timely and effective decisions (Lucey, 2005).

Organizations operating in automotive industry generate a huge amount of manufacturing data. Management approaches emphasise data-driven decision making in the automotive industry more than in many other industries. Data-drivenness is about building tools, abilities, and culture that acts on data (Zgodavová, Hudec and Palfy, 2017). It requires robust solutions with efficient data collection, business intelligence capabilities and analysis support speeding

up reactions upon time-sensitive data coming off the shop floor (Lengyel, 2013). The MISs help managers to get in touch with every activity running in a workplace and can help make valid decision by providing accurate and up-to-date information and performing an analytical function. Timely provided information is crucial for effective quality assurance. If the needed information is provided quickly enough, the problem can be recognised and suitable corrective actions can be implemented to avoid the problem reoccurrence (Nagyová and Palko, 2016). Corrective action requires understanding of quality problems. Therefore there is a need to ensure effective information flow and to make necessary information timely accessible to those who need them in the process of decision making related to quality improvement activities.

Information needs of managers are the basis for projection and improvement of Management information systems. It is necessary to ensure the effectiveness of MIS, which enable to select and provide the needed information on time and transmit it to those who need it. It is a challenge for organisations to better understand and manage processes for capturing, utilisation of data and improve information flow in the organisation to support decision making (Laudon and Laudon, 2013). In order to find ways how to improve the information flow, it is crucial to understand.

- Who needs the information?
- What information is needed?
- Where is the information stored?
- When to use the information?
- How does the information support the particular process?

Information flow is an important part of workflows (Al-Halkim, 2008). Process modelling enables to graphically present the process steps and activities within the process (Zgodavová and Lengyel, 2011). It also It can serve as a means for understanding of the present state and identifying potential improvements in workflow and dataflow (Sadiq, et al., 2004). Process modelling is usually used to map two different states of the process: As-is, the state of the process as it is right now, without making any changes or improvements, and To-be, the future state, after making changes or improvements.

The research presented in the paper uses the process modelling for describing of the automotive component production processes and information flow within these processes before and after the proposed changes in the information flows. The simulation of the process models (present and future state) enabled to show the expected effect of the changes in the information flows on the product quality.

2 METHODOLOGY

The research was conducted in the supplier organisation producing interior components for automotive industry such as dashboards, door panels, armrests and centre consoles. The organisation has recently implemented the new Information System (IS), which is used for data acquisition in the production processes and its immediate evaluation and smart online reporting according to user`s requirements. The IS enables paperless data acquisition at workplace via industrial touch screens, tablets or automatic connection to the selected devices. Before the implementation of the IS, data were recorded on the paper checklists, dispatch notes and entered then to the system. The implementation of the IS brought significant improvement in data acquisition and information sharing. Quality data are actual and correctly recorded in the place and time of their generation and processed immediately and systematically. It helps competent employees to gain access to the needed information for right decision making in the production processes. This solution significantly reduced operators' working time and accelerated analytical activities and decision making.

The system can be further improved and tailored, and new possibilities of data and information utilisation are seeking in the organisation to improve quality, productivity and reduce production costs. After getting acquainted with the production processes and current information flows in the organization, improvements in data processing and information flows were proposed which might result in the acceleration of decision making related to product quality and reduction of defects and related production costs.

Fig. 1 shows the process of the door panel production consisting of the leather and PVC processing and glue preparation for the wood fibre coating and processing. It also shows the data flow from the quality control processes in the central database to be processed. There are also visible the proposed information flows in the production processes if there are at least three identical defects. The current conditions enable to get valuable information on product quality in the form of various reports to all competent employees according to their needs. However, the information system is unable to send an automatic warning notification about increasing number of identical defects to those who make a decision in production processes. The proposed change in data processing and information flow will enable to send an automatic warning notification in the case of at least three identical defects, which will be displayed via touch screens in every workplace, where the defect could be generated. Thus the information will get to the production in real time to right workplaces and all competent employees. The decision and improvements in the production processes will be made on time, which will have a positive effect on product quality and production costs. After the notification-receiving, it will have to be confirmed by the competent employee and corrective actions will be implemented on the base of the information. Counting of the identical defects will start again after the confirmation of the last notification.

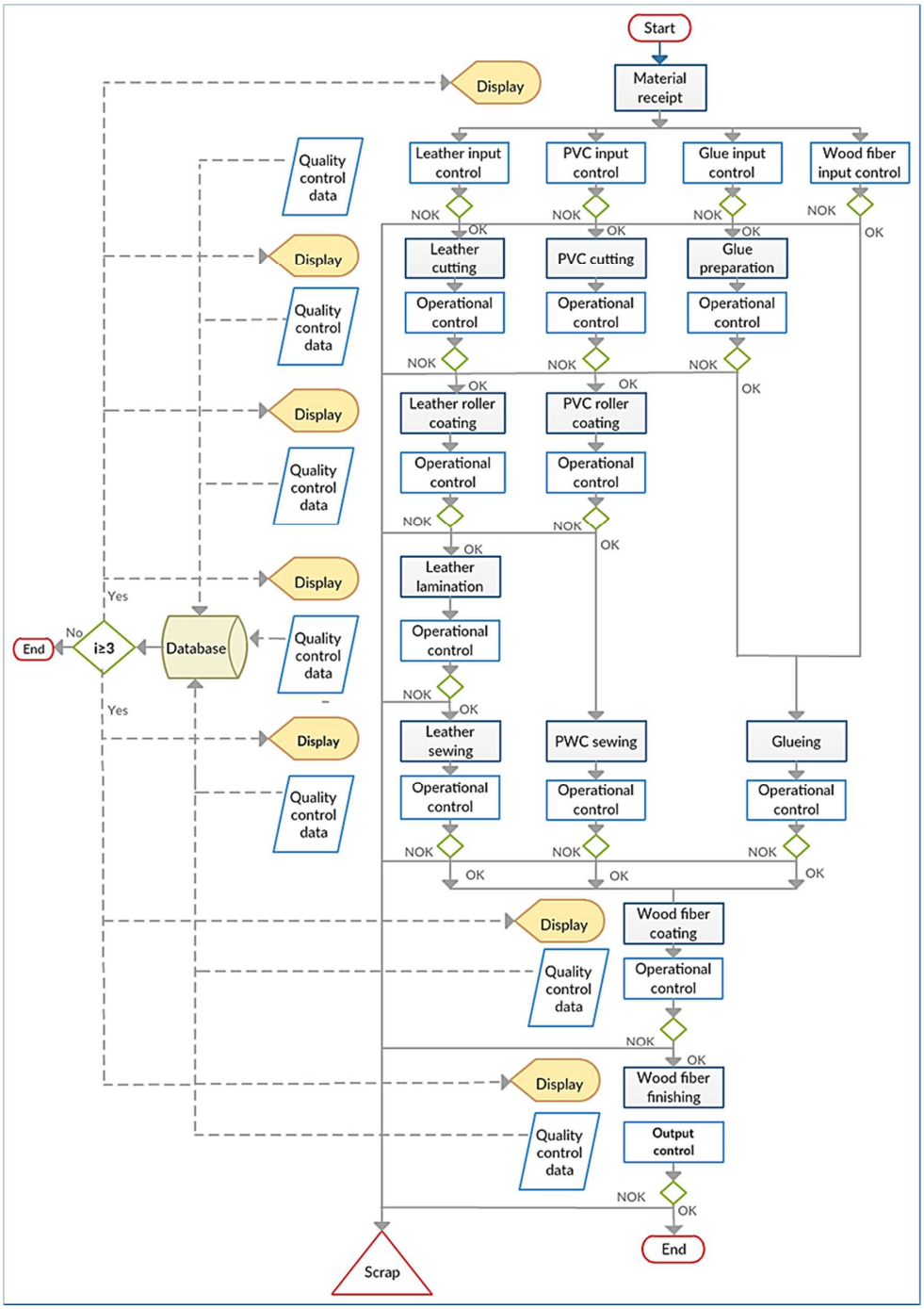

Figure 1 – Flowchart of the Component Production Process

To test the effect of the proposed changes, the simulations were made in the QPR Process Guide 8.1 software. The simulations of the current process model and

process model with the improved information flow were realised to compare the result. In order to run the simulation, real process parameters were entered to the QPR software, which were time duration of the individual activities, resources assigned to the activities and probability of the defect occurrence in the case of decision blocks. The probability of defect generation was entered to the system based on the information gained from the central IS of the organisation to simulate the current process model. For the simulation of the proposed model with the changes in information flow, the probability of the defects occurrence were reduced based on the results of the test operation and implementation of corrective action after receiving the notification in particular processes. For both of the models, five simulations were run.

3 RESULTS AND CONCLUSION

Tab. 1 shows the results of the process models simulations. The results indicate the lower number of defects in the case of the proposed process model in comparing to the current one. The total sum of the difference is 75 defects, which means a reduction of defects by 54%. The higher difference in defects generation is in the process of Wood fibre coating.

Table 1 – Results of Simulation of the Current and Proposed Process Model (Source: Segiňáková, 2017)

Operational control in the processes	Average number of defects (current state)	Average number of defects (simulated state)	Difference in the number of defects
PVC cutting	2	2	0
Leather cutting	27	21	6
Gluing	29	22	7
Leather lamination	2	1	1
Sewing	3	2	1
Wood fibre coating	74	15	59
∑	138	63	75

Accurate, timely and useful information are necessary for effective decision making in the production processes and implementation of improvements. Data generated in the production processes should be processed in a way enabling to provide useful information and transmitted it in the right time to right people. The automatic information providing an increasing number of identical defects within the production processes in real time enables to identify problem's causes and implement corrective actions on time what significantly improve quality of production and reduce costs related to defected products.

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