BUSINESS LINES CORRELATION ASSESSMENT: A NOVEL ENTREPRENEURIAL DECISION-MAKING SUPPORT FRAMEWORK

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Abstract
Sustainability is probably the ultimate goal of any entrepreneur when initiating or developing a business. As it involves competitiveness, companies aim to produce differentiated economic offerings by reusing and sharing processes, components, information and knowledge - many times from different domains. However, to be effective, this should be envisaged already when developing the entrepreneurial plan, or when assessing the opportunity of extending the business – therefore the need for planning / implementing / integrating several business lines (from various domains). As many of them may look attractive, an effective decision of starting one business line or another should be supported by some tool that allows a systematic assessment of the opportunity of implementing them. This paper proposes an algorithm that supports entrepreneurs in this respect. The opportunity of developing new business lines is assessed by estimating the mutual impact between them and existing business lines, their impact on organizational performance, and additional indicators such as financial effort, the estimated return on investment, technical and organizational difficulty, risk level or domain financing opportunities. An application example is presented in which an SME in an interdisciplinary domain (covering IT and life-sciences) assesses the opportunity of opening two new business lines.

Keywords
diversification strategies, business lines, support framework, SMEs

JEL Classification
O20, O22, O30

Introduction

Every entrepreneur, when setting up or developing a business, envisages its sustainability, which means to be able to last or continue for a long time (Candea, 2007). Sustainability implies three major aspects – environmental, societal and economical (Seliger et al, 2008) (Meier et al, 2010), which have to be carefully balanced (Schonsleben et al, 2010). For companies, innovation –

which is strongly related to sustainability (Klewitz et al, 2014) – should focus not only on products and services offered, but on all their key business processes.
By reusing and sharing processes, components, information and knowledge (many times from different domains) over a family of products and services, companies can efficiently produce a set of differentiated economic offerings (Aggarwal et al, 2013), thus creating more added value for their customers. However, to be effective, this should be envisaged already in the stage of developing the entrepreneurial plan, or when assessing the opportunity of extending the business – therefore the need for planning / implementing / integrating several business lines from various domains (for instance to integrate software with electronics in order to provide smarter household devices, or graphic design with communication abilities, in order to create better corporate identity services). In other words, an adequate *related diversification strategy* should be developed (Boz et al, 2013).
Nevertheless, there are a lot of possible directions for diversification of products and/or services (either if differentiation, customer loyalty or target group extension is envisaged), therefore many business lines may look attractive to the entrepreneur or the management team. However, a diversification strategy alone will not produce superior performance (Boz et al, 2013). An effective decision of starting one business line or another should be supported by some tool or method that allows measuring or systematically assessing the opportunity of implementing that business line (i.e. to estimate if (and how much) it contributes to the business sustainability, if it has a positive impact on other existing business lines, if there is some difficulty or risk related to it or if it is too expensive). For instance, a company providing web development services might want to provide also multimedia processing services and also consulting on communication and branding. However, as diversification is a time and resource consuming process (Park et al, 2013), the opportunity of starting new business lines should be thoroughly assessed. This paper proposes a framework (decision-making support algorithm) that supports entrepreneurs in this respect. The opportunity of developing new business lines is assessed by estimating the mutual impact between them and existing business lines, their impact on organizational performance, and additional indicators like financial effort, estimated return on investment, technical and organizational difficulty, risk level or domain financing opportunities.

Review of the scientific literature. A survey was conducted within both scientific literature and over the world-wide-web to identify similar approaches on assessing the opportunity of starting new business lines (within related diversification strategies). Scientific literature databases were queried by the following series of keywords: *+specialized +diversification*, *+diversification +strategy*, and *+related +diversification*. Results related to the approach in this paper are discussed below.
In (Duhaime, 2015) advantages and disadvantages of the related (or horizontal) diversification are discussed, the approach being in line with the one hereby proposed for analyzing potentially new business lines. In (Bowen et al, 2015) the impact of diversification on firm performance is discussed, but it is noted that this has to be still better understood. In (Boz et al, 2013) the non-linear influence of (related) diversification on a company performance is discussed, highlighting its advantages over unrelated diversification. The relationship between diversification strategies and organizational performance is also discussed, but the latter is measured rather by financial indicators like Return on Assets and Return on Sales. The work (Teece, 2015) focuses on cross-industry diversification, analyzing also approaches in literature claiming that diversification on average reduces performance compared with comparable single-business firms. The work (Park et al, 2013) investigates the effects of within-industry diversification and related diversification

strategies on company performance, highlighting that diversification strategies inevitably require large organizational changes and rearranging resources within a company.
More results, more or less in line with the above ones, can be identified in literature (for instance a plain web search using the "related diversification strategy" keywords returns nearly 2 million results). However, no relevant result could be identified to deal with assessing the opportunity of starting new business lines by using the approach proposed within this paper (being either too general or not sufficiently related).

Paper outline. The remaining of the paper is structured as follows: Section 2 discusses the proposed algorithm (the core idea and the algorithm steps), Section 3 discusses an application example (the case of an SME in the IT and life-science domain wishing to start two new complementary business lines), and Section 4 discusses conclusions and future work.

The proposed algorithm

To address the challenges described above, the authors propose a novel algorithm, targeted towards decision makers in SMEs, aiming to support them in deciding whether the initiation of a new business line (as part of their diversification strategy) is attractive or not.
The proposed algorithm is built upon the following core ideas: (a) the new business line should have a positive impact on the existing business lines, (b) the other business lines (and supporting business processes) should support the new business line, (c) the new business line should be able to exist (with a specific performance level) also independently, and (d) the new business line should have a positive impact on the organizational performance. The algorithm is graphically represented in (fig. no. 1).
The very first step of the algorithm consists in describing the existing business lines of the company by considering, for each one, its (market) requirements and its key performance characteristics (like in a traditional performance planning approach). In this phase the support business processes (for instance idea management processes or employee skills development processes) should be also described in a similar manner (by using requirements and performance characteristics). In this step an assessment of the current organizational performance level (to be further used as a reference) should be made. A dedicated software tool like *business eXXplorer* can be used (Brad et al, 2006).
The seven algorithm phases, described below, focus on assessing the opportunity of starting a new business line by implementing the core ideas (a-d) discussed above.
Phase one consists of identifying the market requirements and defining the performance characteristics for the new business line (only). Requirements should be ranked (for instance by using the Analytic Hierarchy Process (AHP) method) and performance characteristics should be planned (for instance using the well-known Quality Function Deployment (QFD) method) (Fulea et al, 2014). Target values should be established so that the new products or services (offered through the new business line) would be competitive on the market.
Phase two consists of analysing the relationships between the new business line performance characteristics and the existing business lines requirements. The graphical support of the QFD method can be used to complete this step. More numerous and stronger relationships indicate that the products or services envisaged through the new business line may have a good potential added value for the customers as they already respond to their needs. A phase score (s1) is computed (e.g. the weighted sum of the relationship values).
Phase three consists of analysing the relationships between the existing business lines and support processes performance characteristics and the new business lines requirements. The graphical support of the QFD method can be used to complete this step. More

numerous and stronger relationships indicate that some features of existing products or services offered by the company already address some requirements corresponding to the new business line, which might for instance increase the acceptance of the new products or services (at least for the existing customers). A phase score (s2) is computed (e.g. the weighted sum of the relationship values).

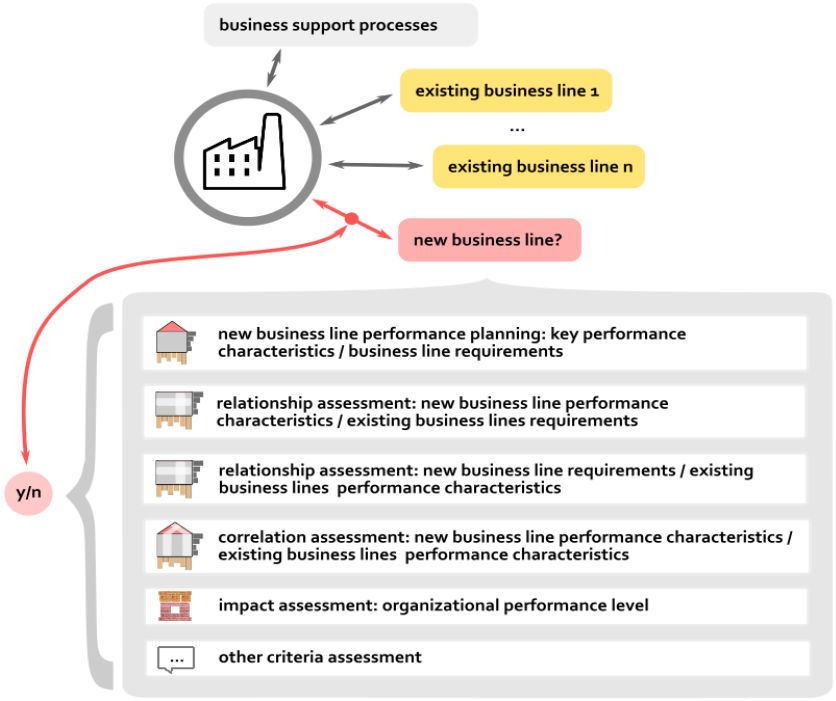

Fig. no. 1 The proposed algorithm

Phase four consists of analysing the correlations between the existing business lines and support processes performance characteristics and the new business line performance characteristics. The graphical support of the QFD method (i.e. the House of Quality roof) can be used to complete this step. A higher number of positive correlations could mean that obtaining better target values for new products or services would allow obtaining better performance also for existing products or services (or for support business processes). A phase score (s3) is computed (e.g. the number of positive correlations). Negative correlations can be addressed by using innovation tools like the TRIZ Contradiction Matrix (Brad et al, 2009).

Phase five consists of analysing what impact on organizational performance would the new business line have. The same tool or approach as in the initial step should be used. If using the *business eXXplorer* tool, a *what-if* scenario assessment could be performed (by considering a successful implementation of the new business line) and results could be automatically be compared to the initial assessment. A phase score (s4) is computed (e.g. the improvement of the global performance value computed by *business eXXplorer*).

Phase six consists of assessing more criteria related to the opportunity of starting the new business line. The algorithm proposes a criteria set, but it could be customized to fit any business domain specificity. The criteria set could be: (c1) financial effort, (c2) the

estimated return on investment, (c3) technical and organizational difficulty, (c4) risk level, (c5) domain financing opportunities (e.g. grants). For each criteria a score should be calculated (or estimated).

Phase seven consists of deciding, based on the data determined in the initial step and phases 2-6, whether the new business line is worth starting or not. Given the specificity of each business domain, it is difficult to propose a fixed decision algorithm; however, some approaches can be highlighted. For instance, the new business line could be attractive if each score is above some level, if some scores are significantly high, or if there is a fair balance between the obtained scores. The criteria can also be ranked (for instance using the AHP method) and an aggregate score could be computed.

Application example

The proposed algorithm was applied for an SME in an interdisciplinary domain covering IT and life-sciences. The company was founded 4 years ago and initially offered services related to e-learning content creation, having 2 employees. With an adequate diversification strategy (envisaging sustainability), it now has over 15 employees and several (correlated) business lines: (b1) software development (web & mobile) for life-sciences, (b2) data management & statistics (life sciences), (b3) IT auditing, (b4) general IT support, (b5) e-learning content creation (for life-sciences), and (b6) general graphic design.

The algorithm proposed in this paper was applied by the company in order to assess the opportunity of opening two new business lines: (n1) branding & identity services and (n2) general HR services (both targeted to companies in the life sciences sector).

Both new business lines seem appropriate, (n1) being strongly related to (b6) and (n2) being a request from existing customers. However, the company would like to quantify their impact on the overall business performance in order to (also) estimate their potential contribution to the business sustainability. The results obtained by applying the algorithm are presented below.

Preliminary phase. Each existing business line was described by market needs and performance characteristics. The following support business processes were considered for the analysis: (s1) internal knowledge base repository management, (s2) employee idea management, (s3) employee skills development management. For space reasons, requirements and performance characteristics are detailed here only for one existing business line and for one support process.

For business line (b6) *general graphic design* the following requirements were formulated: (b6.r1) service should be fast, (b6.r2) results should be creative and original, (b6.r3) needs & wants should be understood or foreseen, (b6.r4) there should be a repository with demo work. The following performance characteristics were formulated (measurement units and target values are within brackets): (b6.c1) deployment time [days, 2-14], (b6.c2) refinement steps [#, 1-3], (b6.c3) result scalability [#, >5 environments], (b6.c4) result originality [1-10 mark, >7], (b6.c5) repository design categories [#, >10].

For support business process (s1) *internal knowledge base repository management* the following performance characteristics were formulated: (s1.c1) repository topics [#, >12], (s1.c2) kb entries relevance [1-10 score, >7], (s1.c3) contribution frequency [new kb entries / employee / month, >2], (s1.c4) kb entry understandability [1-10 score, >7], (s1.c5) kb searches [hits/employee/day, >1].

The assessment of the current organizational performance level (to be further used as a reference) was made with the *business eXXplorer* software tool. Within an organizational performance assessment, *business eXXplorer* computes a global performance level (GPL) and a capability index of the organization (OCI) by evaluating the 9 key components of a

business (leadership, strategies / policies / marketing, resource management, personnel management, technical processes, employee satisfaction, customer satisfaction, society satisfaction, financial performance) through 166 criteria. In our case, the obtained values were GPL = 37.8% and OCI = 0.796.

Phase one. Market requirements were identified and performance characteristics were defined for the two proposed business lines; they are summarized in (Table no. 1), values in brackets representing the requirements weights (obtained with AHP) and the performance characteristics measurement units, target values and weights (obtained with QFD).

Table no. 1 Requirements and performance characteristics for the proposed business lines

Line/Process	Requirements	Performance Characteristics
(n1) branding & identity services	• visual identity theme should be original [13%] • needs & wants should be understood / foreseen [21%] • additional support (e.g. for a professional blog) [18%] • help in gathering feedback on brand [19%] • help in raising awareness on the brand/identity [29%]	• visual identity theme originality [1-10 mark, >7, 16%] • visual identity refinement steps [#, 3, 19%] • brand impact reports [# (frequency), 2/year, 30%] • additional tools [professional blog / local events / etc, >6, 35%]
(n2) general HR services (both targeted to companies in the life sciences sector)	• assistance in HR planning (recruitment, selecting, training, evaluation etc) [32%] • assistance in employee remuneration strategies [17%] • assistance in employee performance management [33%] • assistance in employee relations management [18%]	• phases of Employee Lifecycle supported [#, >4, 28%] • trainings (topics on life-sciences) offered [#, >30, 24%] • candidate database [no of CVs, >50, 48%]

Phase two. The relationships between the new business lines performance characteristics and the existing business lines requirements were analysed using the graphical support of the QFD method. Partial results (due to space constraints) are shown in (fig. no. 2). A score was computed for each potential business line (representing the number of significant relationships between each new business line's performance characteristics and existing business lines requirements); (n1) *branding & identity services* scored 41 and (n2) *general HR services* scored 23.

Phase three. The relationships between the existing business lines and support processes performance characteristics and the new business lines requirements were analysed using the graphical support of the QFD method. Partial results (due to space constraints) are shown in (fig. no. 2). The scores obtained were 23 for (n1) *branding & identity services* and 18 for (n2) *general HR services*.

Phase four. The correlations between the existing business lines and support processes performance characteristics and the new business line performance characteristics were analysed using the graphical support of the QFD method (the House of Quality roof).

Partial results (due to space constraints) are also shown in (fig. no. 2). The scores obtained (the positive correlation count) were 31 for (n1) *branding & identity services* and 17 for (n2) *general HR services*.

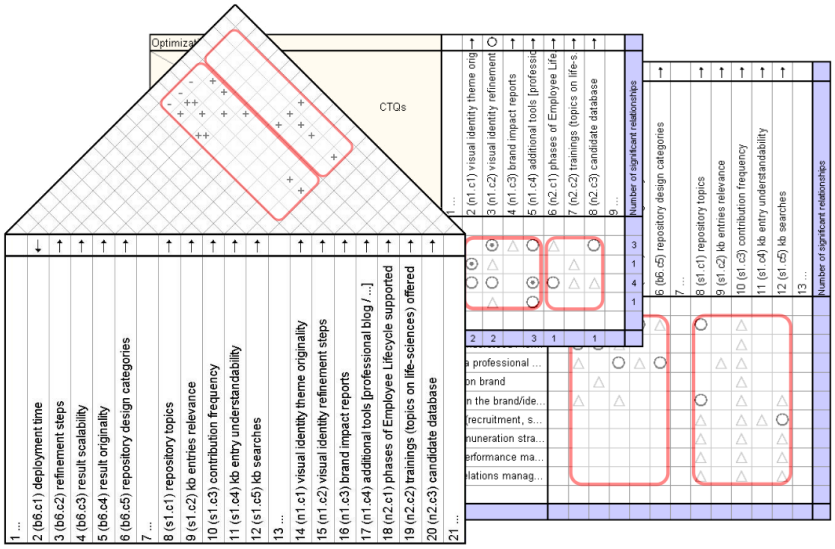

Fig. no. 2 Results for phases 2-4 (using the *Qualica QFD* software)

Phase five. Two what-if scenarios were constructed and then assessed using the business eXXplorer software tool. The scenario based on (n1) *branding & identity services* scored an GPL of 38.8% and a OCI of 0.818, while the scenario based on (n2) *general HR services* scored an GPL of 39.2% and a OCI of 0.843.

Phase six. The following criteria related to the opportunity of starting the new business lines were also assessed: (c1) financial effort, (c2) the estimated return on investment, (c3) technical and organizational difficulty, (c4) risk level, (c5) domain financing opportunities. The scores obtained for each potential business line (on a scale from 1 to 10) were 4 and 5 for c1, 3 and 6 for c2, 5 and 2 for c3, 5 and 4 for c4, and 2 and 6 for c5.

Phase seven. Based on the data determined in the phases 2-6, both potential business lines are correlated with the existing ones, especially (n1) *branding & identity services*, although (n2) *general HR services* seems to have a higher impact on the organizational performance and seems to generate more revenue (but being also more difficult to implement). Therefore, the management team of the company decided to start both of them, with a special focus on (n2) *general HR services.*

Conclusions and future work

The proposed algorithm aims to be a relatively simple and straightforward tool to be used by entrepreneurs and management teams that need a decision-making support within their related diversification strategies. It considers several facets of the problem of starting new related business lines, considering not only their potential direct benefits, but also the impact they could have on existing business lines and on the overall organizational performance. The authors consider that, in this way, sustainability can be better attained within a diversification strategy. However, no "direct" or "correct" route towards business sustainability can be determined, but a robust analysis (and planning) of diversification can nevertheless determine long-term competitiveness which in turn can determine sustainability.

Depending on the complexity of the business lines and company specific aspects, the algorithm can be applied involving a not so detailed analysis (and therefore taking less time and effort). However, an in-depth analysis based on the algorithm should be proportionally reflected in the accuracy of the results.
Regarding future work, to maximize the acceptance level of the proposed algorithm within SMEs (where planning tools like the ones used in this paper are not that common), a software tool to implement the algorithm is foreseen.

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