Should seed investors read business plans ?

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Abstract

A business plan is a document presenting in a concise form the key elements (management, finance, marketing, ...) describing a percieved business opportunity. It is used among others as a tool for evaluating the feasibility and profitability of a project from the entrepreneur' or investor's point of view.

In this work, we try to analyze to which degree a well-thought and well-written business plan leads to a successful venture in order to understand the link between business plan quality and venture success.

We used a sample of 119 business plans that were collected in the context of a business plan competition organized in France, Belgium, Germany and Luxembourg. Each business plan was evaluated by experts, on a double-blind basis, according to seven criteria, with grades ranking from 0 to 10. Concerning the expected result of the classification, a project is considered successful if (1) it leads to an actual commercial activity and (2) it is still in activity 24 months after the initial assessment.

When one tries to predict the success or failure of a project, one has to (1) find the most relevant criteria among the initial ones, (2) choose and design a classifier, and (3) choose a meaningfull threshold (cutoff value). The aim of the latest is to optimize an application-driven criterion, which might not be the classical 'least misclassification number' or 'least mean square error', while the first stage (variable selection) is necessary because of the small sample size, which forces to restrein the number of parameters in the models.

To select the most useful variables (criteria), two approaches are commonly used. The first one consists in measuring the relevance of each single variable by evaluating its correlation (or in a more general manner, its mutual information) with the expected result of the classification. The second is based on the analysis of the performances of actual classifiers (in our case, a logistic regression and a k-NN model) built on each single variable. Note that both approaches can be upgraded to a constructive (iterative) method , where individual relevance is used at each step to add or subtract a variable.

In order to compare non-linear classification methods to those classically used in entrepreneurship, we use two different models (techniques), namely a logistic regression (logit) and a k-nearest neighbour (k-NN). A resampling technique (leave-one-out) is used to validate them.

Since not investing in a successfull venture is not as annoying as investing in a project that fails, the standard approach of minimizing the total number of bad classifications is certainly not a good criterion. Furthermore, the number of positive samples (success) being far lower than the number of negative samples (failures), minimizing misclassifications will eventually lead to a null-investment policy. As a consequence, we try to maximize criteria that are more application-specific, such as the precision or the recall. This is achieved by using an appropriate cutoff value (threshold) between the two classes at the output of the classifiers.

In [1], the choice of a cutoff value was made according to the priors of each classes ($p_{success} = 0.17$), and a logit was used. We used a criterion-based cutoff choice for both a generalised linear model (logit) and a non linear one (k-NN). When precision is maximized with both models, the k-NN tends to reach a better recall than the logit, but its absolute precision is lower. The definitive choice between those models might be made using more domain-specific information such as the expected return-on-investment for each project.

References

[1] B. Gailly, *Les projets d'affaire en phase de démarrage : étude empirique et implications pour les structures d'appui.* Proceedings du 2ème congrès de l'académie de l'entrepreunariat, Bordeaux, Avril 2002.