

Projecting a Functional Model of Financing Government-Backed Innovative Projects in Small Entrepreneurship

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Abstract—Small innovation entrepreneurship nowadays suffers certain difficulties related to finding financial resources for starting up and development. Financing innovation projects of small entrepreneurship allows to solve several problems simultaneously, such as creating more jobs, improving welfare of the population, adjusting to changing conditions of the environment, etc. Within the framework of the study, a functional model of financing government-backed innovation projects in small entrepreneurship has been devised. The study results offer a context diagram and decompositions of several layers of government-backed financing scheme for small entrepreneurship. The practical value of the study is corroborated by a possibility to use the devised functional model for the purposes of strategic planning and monitoring small innovation entrepreneurship finance programs.

Keywords—functional model; innovation projects; small and medium entrepreneurship

I. INTRODUCTION

Transition of the scientific and technical policy to an innovative policy is caused by creation of integrated management system for developing and practical implementation of innovation. A differentiated approach is needed to solve the objectives set, since the industrial sector of the modern economy consists of different clusters: large technological companies and small innovative business which is considered to have a priority in innovative economy development [1]. A number of scientific articles highlight research in estimation and modelling of cost-effectiveness in different economy spheres including small entrepreneurship [2, 3, 4].

The aim of the study is to design a functional model of financing government-backed innovation projects. The study was conducted within the project of devising financing facilities for government-backed small entrepreneurship to structure the financing process. Statistics related to dynamics of the small and medium entrepreneurship made up the database of the study [5, 6].

II. METHODOLOGY

Designing a functional model of innovation project financing in small business was done using the methodology of the system analysis and design techniques developed by D. Ross [7]. Designing was done in notation IDEF0 which is a

system of hierarchized diagrams with the further decomposition of every higher layer constituent. As a source environment used for designing the functional model of government-backed venture project financing, the software CA Process Erwin Modeler was used. This software allows to design functional models in a number of notations and in IDEF0 notation, in particular. When designing decompositions of the functional model, scientific methods of the system analysis and synthesis were used.

The functional model for a particular activity is a set of following constituents:

- context diagram which is represented with one block; the name of the block describes the basic function of the system examined with account for the study aim and objectives;
- set of decompositions specializing every functional block of the diagram of a higher hierarchical layer with account for specific implementation of functional potential. The specialization degree in decomposition depends on the study objectives and availability of information that helps to design a functional model for a certain sphere [8].

III. FUNCTIONAL MODEL OF INNOVATION PROJECTS FINANCING

The context diagram of the functional model of government-backed venture project financing is shown in Fig. 1.

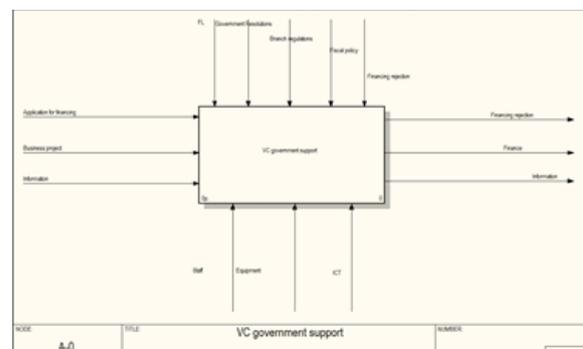


Fig. 1. The context diagram of the functional model (developed by the authors).

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The context diagram entry within the framework of designing the functional model of government-backed venture project financing consists of the following constituents:

- Application form for innovation project financing that includes the required information.
- Business project (business plan) to determine the basic trends of project developing and to attract investment.
- Other information that can be used to approve or to reject project financing.

The following constituents are shown on the context diagram as a controlling action:

- Federal laws and government regulations [9];
- Basic targets and parameters of fiscal and monetary policy that reflect the target indicators and rated parameters of the system functioning with regard to taxation, easy-term loans and subsidizing at implementing high risk government-backed innovation projects [10, 11];
- Branch regulations stipulating specific functioning of systems (entities) involved in innovation project implementation.

At the exit of the context diagram the following constituents are shown:

- Financial support provided for the innovation projects in accordance with the submitted application form and business plan that considers the environment, competition, degree of novelty, relevance, research intensity of the business project.
- Rejection of financial support after evaluating the application, provided some requirements or business plan parameters are not met.
- Other information.

The 1st layer decomposition of the functional block of the context diagram “The venture project government support” includes a number of functional units (Fig. 2).

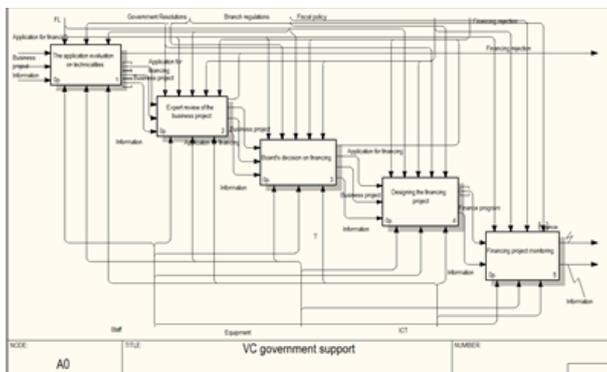


Fig. 2. The 1st layer decomposition of the functional block “The venture project government support” (developed by the authors).

Every indicated block of the first layer decomposition has some exits of double service:

- Set of documents including the application form for financing, business plan to start up an innovation project, and information used for making decisions related to providing financing. If the business plan is approved, the exits of every preceding functional block come to be the entries of every sequent functional block.
- Rejection of financial support, if the submitted business plan or application form fail to meet the requirements.

To specify the discussed functional blocks, designing of the 2nd layer decomposition of the functional block “The application evaluation on technicalities” (Fig. 3) has been performed.

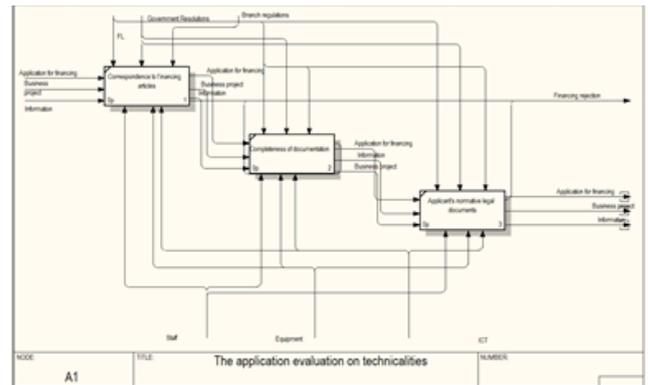


Fig. 3. The 2nd layer decomposition of the functional block “The application evaluation on technicalities” (developed by the authors).

The 2nd layer decomposition of the functional block “The application evaluation on technicalities” includes the following units:

- “Correspondence to the financing article” examines whether the business plan corresponds to the priorities in innovation project financing. If the business plan is not in line with the priorities of government support, the applicant will not get financing.
- «Completeness of documentation». If the set of submitted documents is not complete or any document fails to meet the guidelines requirements, the functional block «Completeness of documentation» offers the exit “Financing rejection”.
- “Applicant’s normative legal documents” looks at the normative legal documents to determine the legal boundaries, spheres and major business lines of the potential applicant and his/her loan support [12].

If the documents meet requirements, there are three exits on the 2nd layer decomposition of the block “The application evaluation on technicalities”: application form for further financing; business project (business plan); specific information needed for the application evaluation on technicalities.

If the documents meet the requirements of the application evaluation phase, decomposition of the block “Expert review of the business plan” is performed (Fig.4).

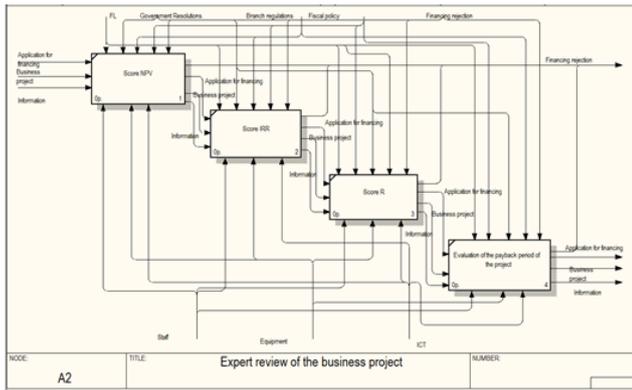


Fig. 4. Decomposition of the functional block “Expert review of the business plan” (developed by the authors).

Decomposition of the functional block “Expert review of the business plan” includes the following units:

- “NPV evaluation/check”. This step looks at the net present value of the project and whether this value corresponds to the value stated by the applicant in his/her business plan.
- “IRR evaluation/check”. The value of the internal rate of return determined by the experts is compared to the value stated in the business plan, and if this stage is successfully passed, the procedures of the next functional block start.
- “Project profitability evaluation/check” implies the effectiveness estimation of return on investment. If the result of comparison of the expert value versus the value stated by the applicant is positive, the next functional block is discussed.
- “Pay-back period evaluation/check”.

When the expert review of the business project is positive, the documents come to the block “Board’s decision on financing” (Fig. 5).

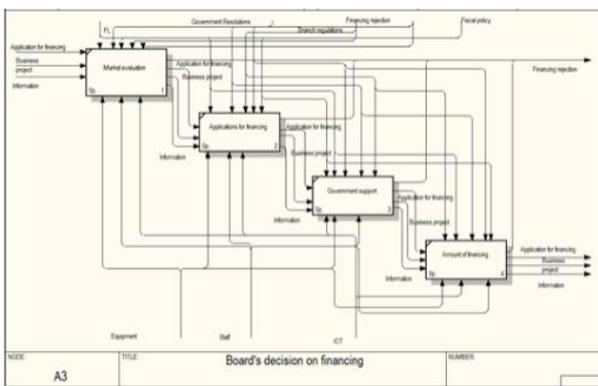


Fig. 5. Decomposition of the block “Board’s decision on financing” (developed by the authors).

Decomposition of the 2nd layer of the block “Board’s decision on financing” includes the following functional units:

“Market evaluation”; “Applications for financing”; “Government support”; “Amount of financing” that determines the amount of financial aid in monetary terms in case of the direct government financing, or the amount of resources of regional and federal infrastructure in case of the indirect government financing of the business project.

When the approval is obtained and the assessments of the “Board’s decision on financing” are performed, the documents come to the block “Designing the financing project” that includes such units as “Investment climate analysis”; “Optimal financing choosing”; “Choosing investors”; “Designing the financing program” (Fig. 6).

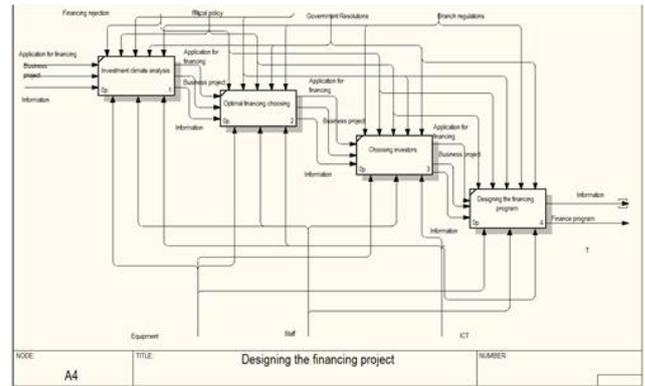


Fig. 6. Decomposition of the block “Designing the financing project” (developed by the authors).

The block “Designing the financing project” being completed, the assessments of the functional block “Finance project monitoring” should be started. The block includes finance program monitoring; monitoring of the project key parameters and contract execution monitoring [13]. Based on the monitoring results, the report is made which includes the information about investor’s, contractor’s or borrower’s full/partial execution of the investment contract or default on commitments, and achievement (full or partial) or failure to achieve the targeted results (values) on every stage of the investment contract.

IV. CONCLUSION

Designing the functional model of the government-backed innovation project venture financing helps to structure a complicated process of providing government financial support which starts with the application receipt and finishes with finance project monitoring. It also helps to track the logical connections in stage-by-stage implementing of the complicated financing process, to identify problems, to determine the monitoring areas, to consider the possibilities of problems solution.

The practical relevance of the study can be corroborated by a possibility of using the devised functional model in developing strategic plans of innovation project financing and monitoring.

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