

Editorial

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The importance of small–medium enterprises (SMEs) in today’s economy has been widely recognized, both in regard to the role and number of such firms and to their contribution to gross national product, employment, and local economic well-being.

However the perception appears to be that system dynamics (SD), at least in terms of published works, is a methodology mostly applied to larger enterprises. The benefits do not seem to be shared by smaller firms, for whom prohibitive costs, lack of access, and/or their focus of attention on day-to-day operations are suggested as critical barriers.

How can SD modelling help small business owners/entrepreneurs and other key company players to improve their strategy analysis/diagnosis, policy-making processes, and operational effectiveness? What role does SD have in areas specific to the challenges of the smaller enterprise; for example, the communication, analysis and debate of the “business idea” to the younger generation in a family business or to new incoming managers; or the evaluation processes conducted by external funders, such as banks, trusts, SME development agencies?

The above issues provide the background to this special edition of *System Dynamics Review*, which aims to explore the role that can be played by SD and systems thinking (ST) in helping SME entrepreneurs to make their tacit knowledge explicit, and to frame better the business context within which they operate.

Although at the time when the then Executive Editor and I first agreed to launch a special issue of *System Dynamics Review* on SMEs we were confident that a number of valuable and insightful contributions would be received, I could have not imagined receiving 16 submitted articles. Five of them have been selected for publication in this issue, while—because of space constraints—two others will be published later in a regular issue.

But now that it has been compiled, what is it possible to learn from the articles included in this special issue?

The first point of interest is that all the articles refer to real cases involving the application of ST/SD to SMEs, in either consulting or research. This suggests a latent involvement of SD scholars and practitioners with smaller firms, in spite of the critical barriers mentioned above. Table 1 gives a summary of the content of the selected articles, and also shows the highly differentiated environments to which the cases relate. These concern:

- the *field of activity* and *key decision makers* involved, i.e., industry (automotive, agriculture, telecom, consulting, etc.), legal form, and organisation

- structure (ranging from family firms run by owner–entrepreneurs, to professionalised companies run by managers, even to co-operatives);
- the *underlying issue(s)* implying the various applications and opportunities for ST/SD, including managing fundamental change like moving from niche to wider markets, promoting a shift in management culture, and refocusing the core business, or managing incremental change—matching commercial with financial policies, understanding inertial effects on strategic assets in e-commerce strategies;
 - the specific *SD modelling domain*, ranging from price, product design, market segmentation, through the re-design of product mix and distribution channels, to the modelling of financial and intangible variables;
 - the *methodology* as applied, namely the integration of SD with accounting models into planning and control systems, the design of user-parameterised generic models, matching SD with conjoint analysis, and with Integrative Systems Methodology.

These highly differentiated SME environments confirm the complexity of the multifaceted universe provided by smaller firms. Unfortunately, this makes any attempt to define general rules for introducing SD/ST into SMEs very difficult, if not even dangerous.

However, in order to frame better the complex world of SMEs, one can learn from the empirical evidence provided by the different articles and infer some possible commonalities among the cases. In this regard, a number of common issues can be related to the fact that most investigated SMEs are lacking in one or more critical resources:

- *human resources* involved in strategic thinking and decision making;
- *tools and information* supporting the management of growth and the timely detection of weak signals of crisis;
- a *sustainable competitive advantage* over larger firms;
- *time to understand* how to manage fundamental and incremental change.

An implication of this resource deficit is that, in order to introduce SD into smaller firms, unique approaches are likely to be required.

This argument is analysed in the introductory article by Bianchi, concerning the use of SD models as part of the SMEs' planning and control process, and is also considered in the article of Winch and Arthur. In the latter article, the authors demonstrate the potential usefulness of user-parameterised generic models as a solution to the conundrum of modelling access for SMEs with limited resources, based on an applied research conducted in the UK. They also describe some significant results from the application of a methodology they have developed in their research project in presenting a scenario-planning simulator based on generic models in different SMEs.

Table 1. An overview of real cases of application of ST/SD modelling to SMEs in research and consulting, as it emerges from the articles published in this issue

Field of activity	Key decision makers	General issue(s)	SD modelling domain	Methodology	Author(s)
Wholesale: <i>Pharmaceutical</i>	Owner–entrepreneur	Managing incremental change: <i>understanding effects on liquidity generated by commercial policies</i>	Terms of payment allowed to customers, net working capital, liquidity, income	Integrating SD and accounting models into planning and control systems	Bianchi
Test equipment manufacturing: <i>Telecom</i>	Management	Managing fundamental change: <i>global telecom deregulation; shift of core business</i> (from manufacturing to design and installation of systems)	Not applicable	Parameterised SD generic models	Winch and Arthur
Sport kites manufacturing	Owner–entrepreneur	Managing fundamental change	Not applicable	Parameterised SD generic models	Winch and Arthur
High-tech and component part production: <i>Automotive</i>	Management	Managing fundamental change: <i>from niche to wider markets</i>	Price, product design, market segmentation	SD and Conjoint Analysis Parameterised SD generic models	Schmidt and Gary Winch and Arthur
Co-operative trade SME: <i>Agriculture</i>	Management	Managing fundamental change: <i>promoting a shift in management culture</i> Co-operating vs competing against larger firms	Product mix Distribution channel	SD and Integrative Systems Methodology	Weber and Schwaninger
Wholesale: <i>Tools for home improvement</i>	Management	Managing incremental change: <i>understanding intangible assets' dynamics in e-commerce strategies</i>	Company items, mailing lists, contacts with other web sites, customer base, customers' queries database	Stock and flow qualitative mapping	Bianchi and Bivona
Electric vehicles manufacturing	Owner–entrepreneur	Managing incremental change: <i>understanding intangible assets' dynamics in e-commerce strategies</i>	Business image, business contacts, web site investments, sales orders standardisation, delivery delays	Stock and flow qualitative mapping	Bianchi and Bivona
Home improvement: <i>Consulting</i>	Owner–entrepreneur	Managing incremental change: <i>understanding intangible assets' dynamics in e-commerce strategies</i>	Entrepreneur's time, banners, customer base, human resource recruiting and training	Stock and flow qualitative mapping	Bianchi and Bivona

Another commonality among the cases, which can be considered a strength for many SMEs, could be referred to as their flexibility. This is mainly associated with the high potential of the human mind's creativity, which can have free play in such contexts, often characterised by a leaner organisation when compared with larger companies. Exploiting and enhancing the enormous potential of the human being to generate new visions, and to help SME decision-makers to envisage how the future is likely to be, is an important contribution that SD/ST can give to foster the growth of smaller firms. On this issue, the article by Schmidt and Gary shows how the application of SD and conjoint analysis within a high-tech SME consulting project helped decision-makers to sketch future strategies concerning price setting, new product launching for the mass market and the redesign of an existing product positioned in the high-end segment. Further, the article by Weber and Schwaninger shows how SD modelling can be useful in providing support to SME decision-makers in managing fundamental change. They present the results of a project aimed at understanding how to refocus a Swiss co-operative firm trading agricultural inputs and products in the up- and down-stream in the agribusiness chain. Simulations concerning product mix and direct vs local points of sale delivery are presented and discussed.

The final article, by Bianchi and Bivona, discusses another important issue, especially for most small and *micro* enterprises pursuing globalisation strategies through e-commerce. Based on the results of a field survey, the authors analyse, through a feedback perspective, the opportunities and pitfalls underlying e-commerce strategies in three company case studies. In the final section of the article, they also discuss a generic SD model aimed at supporting entrepreneurs in understanding better the processes of accumulation and depletion of strategic assets in SMEs' e-ventures.

At the conclusion of this exciting experience—which I feel has significantly contributed to my knowledge, and whose outcomes I hope will also be useful to the readers of this issue—I wish to thank all the colleagues who contributed to the work. My gratitude is, therefore, addressed to the authors of all the submitted articles, the anonymous referees (who provided very supportive feedback on the original drafts), and other colleagues who “spread the word” about this special issue in different academic and practitioner communities. I wish, however, to offer a special word of thanks to Graham Winch, who first suggested I consider editing this special issue. I feel that the scientific collaboration with him on this endeavour, and generally in recent years, has stimulated new and interesting thoughts in my research.

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