A SD-Based Reflective Strategy Development Process

Wei-yang Wang
Department of Information Management,
National Kaohsiung University of Applied Sciences, Taiwan.
wyang@cc.kuas.edu.tw

Ya-tsai Tseng
Department of Business Administration,
Tunghai University, Taiwan.
yttseng@thu.edu.tw

Abstract

Present firm growth literatures, with notable few exceptions, tend to be static explanations and qualitative suggestions, failing to validate whether the causal ambiguity hidden inside specific growth patterns is completely and correctly explained. Without objective knowledge and information of causal ambiguity, the enhancement of firm strategy formulation process can be rather difficult. In consideration of complex feedbacks and time delay misperceptions that often cause ineffective or counterproductive actions that worsen complex dynamic growth problem, this paper proposes a simulation-based framework to facilitate managers to organize and construct growth logic in pursuit of firm growth. Based on the concept of reflection-in-action that is essential for common practitioner's learning, the proposed framework designs an iterative organizational inquiry and reflection process with the support of an evolving simulation model. The evolving simulation model that starts from what a firm expects and ends with complete firm growth logic employs the system dynamics approach in expressing complex interactions among factors that are relevant to the expected growth. Following the Action Science paradigm, in this paper, a longitudinal research at a participating firm, MeiK Co., is conducted to observe the firm's strategy development and refinement process with the proposed simulation-based growth logic construction framework. How the case under discussion enhanced its understanding of the confronted growth problem and reformulated its growth logic to guide the formulation of relevant growth strategies are clearly illustrated and discussed.

1. Introduction

Firms are often faced with strategic dilemmas regarding the rate and direction of their expansion. On the one hand, growth brings increasing economies of scale and scope and other managerial benefits (Chandler, 1990; Penrose, 1959; Hannan and Freeman, 1984; Lambert, et al., 1991; Tosi et al., 2000). On the other hand, the firm's larger size or scope of operation of the business unavoidably brings a firm to confront with higher complexity in managing interrelationships among tasks of firm operations (Slevin and Covin, 1997; Penrose, 1959). How managers respond to the increasing managerial complexity in pursuing firm growth determines whether the present growth is just a transition or possesses great momentums for further growth.

In the firm growth literature there are two major streams of research on the rates and directions of firm growths. One is based primarily upon cross-sectional observations, emphasizing on the identification of external market factors and internal organizational factors in determining firm success (McMahon, 2001; Mukherji, et al., 1999). The other line of research is focus on the description and the explanation of firm growth patterns. While some researchers work on the development of stage models to describe common growth patterns that most firm experience (Filley and House, 1969; Greiner, 1972; 1998; Churchill and Lewis, 1983; Scott and Bruce, 1987), other researchers discuss how contingent interlocked factors influence the growth patterns and momentums over a period of time and how to resolve the arising problems through a variety of methods, such as strategic alliances, use of cash incentives and employee empowerment practices have been consistently discussed (Aldrich, 1999; Vinnell and Hamilton, 1999; Penrose, 1959; Barringer, et al., 1998). Both two research streams contribute to our knowledge about firm growth, however, with notable few exceptions, within both research streams, discussions of firm growth tends to be static explanations and qualitative suggestions (Dobbs and Hamilton, 2007; Freel and Robson, 2004; Gibb, 2000), failing to validate whether the causal ambiguity hidden inside specific growth patterns is completely and correctly explained. Without objective knowledge and information of causal ambiguity, the enhancement of firm strategy formulation process which is based on the enactment of shared interpretations and understandings (Daft and Weick, 1984; Weick, 1979) can be rather difficult.

Different from strategic management field research, growth dynamics has consistently been a primary theme in system dynamics literature (Forrester, 1968; Sterman, 1988; Oliva and Sterman, 2001). It is found that growth stagnation or collapse may be resulted from imbalanced demand and supply combined with embedded time lags (Lyneis, 1980; Forrester, 1967; Ford, 2001), market saturation and competition (Hall, 1976; Paich and Sterman, 1993), insufficient capacity, and

eroded service quality (Forrester, 1968; Sterman, 1988; Oliva et al., 2003), etc. With the belief that complex feedback and time delay misperceptions often cause ineffective or counterproductive actions that worsen the complex dynamic problem (Dörner, 1989; Sterman, 1989a, 1989b, 2000, 2002; Diehl, 1992; Paich and Sterman, 1993), system dynamists seek to facilitate growth dynamic understanding and design effective policy to sustain growth momentum.

In typical system dynamics research procedure, existing firm growth logic and implemented strategies are modeled by qualitative or quantitative methods to describe the experienced growth pattern of the firm. In many occasions, however, the growth strategies employed by a firm may evolve over time; namely, managers adjust and change their growth strategies when an implemented strategy does not work well. The lack of stable growth logic not only makes the system dynamics modeling difficult but also leads to a more difficult challenge for managers as reflective practitioners (Schön, 1983) to deliberately design sound dynamic structures for firms to grow.

This paper aims to support growth management for firms that have no stable growth logic. Based on Schön's reflective management perspective (Schön, 1983), we propose an iterative system dynamics-based reflective strategy development process to facilitate managers to organize and develop firm growth logic. Different from typical system dynamics modeling which is based on existing dynamic structures, in this paper, an iterative system dynamics modeling process is designed to develop models that evolve with managers' ideal designs towards the implementation of expected growth patterns. An action science research is conducted with a case to illustrate the iterative SD model-based growth management process. How the case under discussion enhanced its understanding of the confronted growth problem and developed its growth logic to guide the formulation of relevant growth strategies are clearly described in the following sections.

2. The SD-Based Reflective Strategy Development Process

The reflective strategy development process is designed to be based on Schön's reflective management concept (1983) that stresses on the organizational inquires and reflection-in-action process. As shown in Figure 1, the strategy formulation is a reflective process that supports managers to iteratively reflective on problem settings, interpret and inquire into the problems, and acquire feedback information for further adjustment. The essence of the proposed reflective strategy formulation process is consistent with microworld that is familiar to system dynamists. However, the objective of the proposed strategy formulation process is not just the facilitation of

organizational learning but the deepening of strategy formulation. Following the reflective strategy formulation process, managers will start from what they expect to achieve and then picture the road map to achieve their expectation with the support of system dynamics as a platform for organizational inquiries.
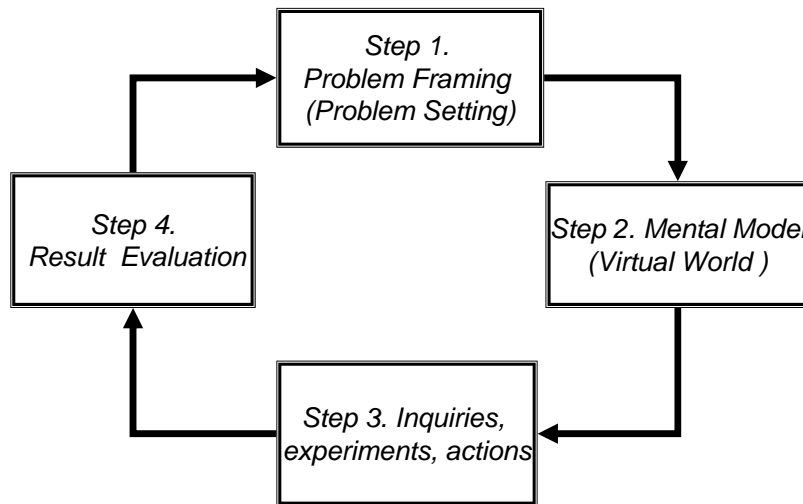
Reflective strategy formulation process

Figure 1 Reflective strategy development process

3. Research Site and Method

Under the tenet of action science (Argyris, 1985), we arranged a research project of strategy development and refinement process at a participating company, MeiK Co., to explore how the focal company clarified and built up its growth model and strategy. We had employed the group modeling process (Andersen, etc., 1997; Morecroft and Sterman, 1992; Vennix, 1996) in building up system dynamics models. The process by which MeiK Co.'s management team as reflective practitioners iteratively redefined and re-formulated growth objective and strategies with the support of system dynamics-based modeling is illustrated and illuminated.

Throughout the research project, the authors had played roles as model builder, intervener, and practitioners (Argyris, 1985; Schön, 1983), facilitating other participants who worked for MeiK Co. to inquire into the firm's growth problem and the underlying structure. The authors had also worked with the project team in building up models and conducting simulation experiments, and launched into detailed explanations, communication, and reflection on actions. There were six persons who had consistently participated in the research project, including MeiK

Co.'s CEO, Sales Manager, Marketing Manager, marketing staff, one of the authors of this paper, and a project assistant. Project meetings were held every one or two weeks and each project meeting lasted about three hours. There were totally thirty-five meetings held in this project. All project meetings were held in the MeiK Co.'s discussion room. The discussion room was especially asked to be arranged in the way that could support comfortable and free discussions and communications.

The participating company in this research project, MeiK Co., is not a big enterprise, which only has ten employees and capital assets of ten millions NT dollars. MeiK Co. is the exclusive agent of an U.S. leading surface care products company in Taiwan. The products that MeiK Co. distributes include cleaners, polishes, waxes, conditioners, and protectants for homes, cars, boats, trains and planes, and almost every type of surfaces. MeiK Co. believes in the great potential of its products for the original U.S. product manufacturer has a long history in producing surface care products. The U.S. product manufacturer has attracted a number of loyal customers with its high-quality products, especially car and motorcycle fans. However, competitions from two different categories of competitors has been consistently threatened MeiK Co. One is from world famous brands, such as 3M and Shell, and the other is from local manufacturers that offer cheap products with basic cleaning functions. While the former has strong brand powers and distribution channels, the latter attracts customers by low pricing strategies. Presently, MeiK Co. sells its products to automotive paint manufacturers, car manufacturers, car dealers, body shops and consumers who are interested in motorcars and motorcycles.

Several years ago, after considering the potential of growing DIY market in Taiwan, MeiK Co. has targeted at consumers who are interested in motorcar DIY activities. MeiK believes that though these DIY customers may be attracted by strong brand images or low price products at first, they will choose MeiK as long as they have usage experiences in MeiK's high quality products. MeiK Co. has allocated most sale forces in broadening distribution channels to DIY customers. As shown in Figure 2, DIY customers buy MeiK products from retailers or directly from MeiK. While the former is the major way that MeiK sell its product, the latter is important for MeiK to broaden DIY customer base *via* websites and marketing activities. In managing downstream retailing channel, MeiK hopes to have more downstream retailers selling its products. To broaden customer base and stimulate the growth of motorcar DIY population, MeiK has also been consistently contacted and sponsored different car fan clubs and communities to hold marketing activities. MeiK hopes to establish its brand image as a motorcar DIY expert and increase the marketing opportunities to attract more people to try MeiK's products.
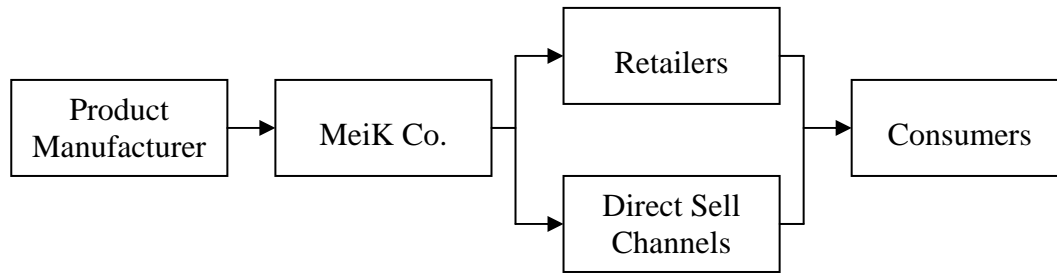
Figure 2 MeiK Co.'s supply chain structure

Since MeiK had made its decision to target at the DIY market, however, revenues from DIY market has not grown as expected. Morale has been falling and human resource attrition has been rising. Management team of MeiK Co. doubted whether implemented policies were correct and wondered that whether it should change its targeted market from DIY consumers to other market segments. Without a distinct growth model of the selected target market, MeiK frequently adjusted its market strategies and human resource allocation policies in the face of more and more severe financial pressure. MeiK Co. contacted with the authors of this paper and asked for help to clarify the growth model of the firm. The authors and the MeiK Co. decided to initiate a research project to facilitate MeiK Co. to develop a growth model of the DIY market to guide further strategic actions and relevant resource allocation.

4. Conceptual growth model of MeiK Co.'s DIY market

At the beginning of the research project, the project team discussed and clarified growth patterns that the firm concerned most. After several meetings and discussions, the project team confirmed that the growths of DIY customers and revenues were what MeiK Co. concerned most, since the number of DIY customers and the amount of revenues were the basis survival and expansion. Based on the two variables, DIY customers and revenues, a conceptual model of the DIY market growth, as shown in Figure 3, was built.
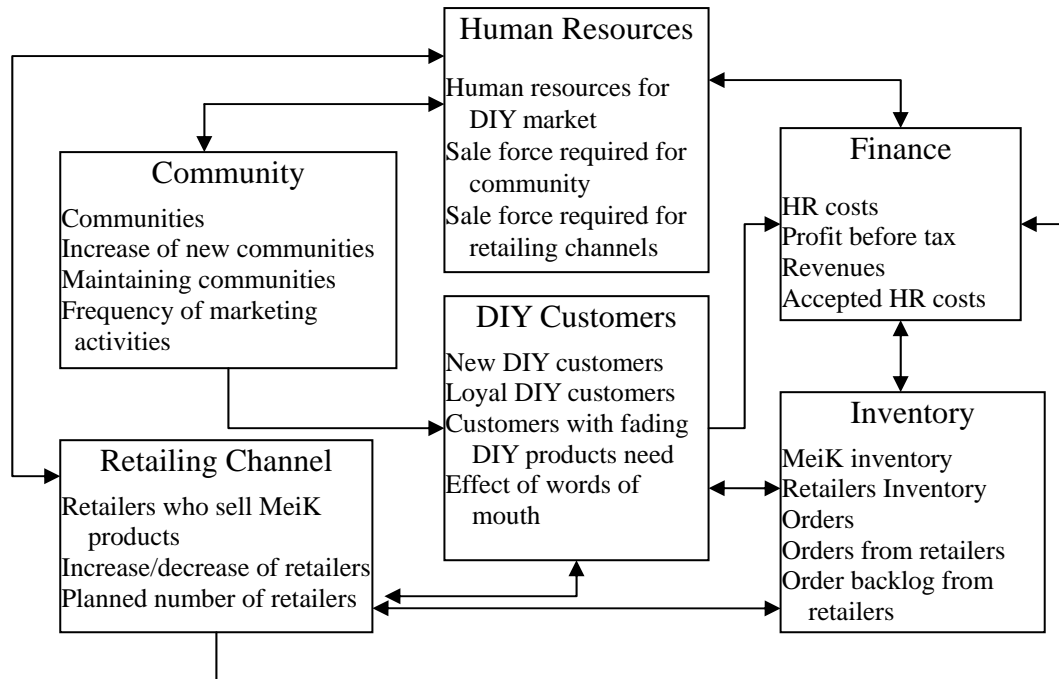
Figure 3 Conceptual growth model of MeiK Co.'s DIY market

From Figure 3, it shows that several sections were identified to be influential in the growth of DIY market, including the Human Resources Sector, the Community (Prospect Customers) Sector, the Retailing Channels Sector, the DIY Customer Sector, the Inventory Sector and the Inventory Sector. The Human Resource Sector contained human resources that were responsible for developing new collaborative retailers (represented in the Retailing Channel Sector) and contacting prospect customers, *via* clubs, communities, and other marketing activities (represented in the Community Sector). The DIY Customer Sector represented the change of the number of DIY customers. DIY customers who purchased MeiK Co.'s products from retailing channels were thought to be influential in creating the incentives for retailing channels collaborate with MeiK Co. to offer good shelf positions and prepare enough amount of inventory for sale (represented in the Customer Sector). The project team thought that inventory management might be the most important activity in MeiK Co. The performance of inventory management influenced MeiK's ability to satisfy orders from retailing channels (represented in the Inventory Sector) and thus its service to DIY customers. How MeiK managed its human resources would impact on the way it develops prospect customers and maintains retailing channels. The six sectors in the conceptual model were interlocked together and not easy for MeiK to clarify. With the overall picture of the DIY market, the project team started the growth model development process. How a series of evolutionary system dynamics models supported MeiK management team in developing its growth logic and formulating

growth strategy is illustrated in the following section.

5. The SD-Based Reflective Strategy Development Process at MeiK Co.

As illustrated in Figure 4, in the MeiK Co. case, there were five questions sequentially discussed in the development process of the growth model of MeiK's DIY market. The iterative SD-based strategy formulation process started from the essential question of what customer growth pattern that MeiK expected and ended at the question of how to develop supportive human resources to achieve the expected customer growth. To support the clarification of MeiK's mental models to growth, an initial system dynamics model that was based on MeiK's expectation towards customer growth was built firstly. The system dynamics model then evolved along with the ongoing discussions of each question. Simulations, experiments, and deep discussions were done at each step to foster common understandings and acceptance of the evolving growth model. Discussions on the five questions are briefed as follows.
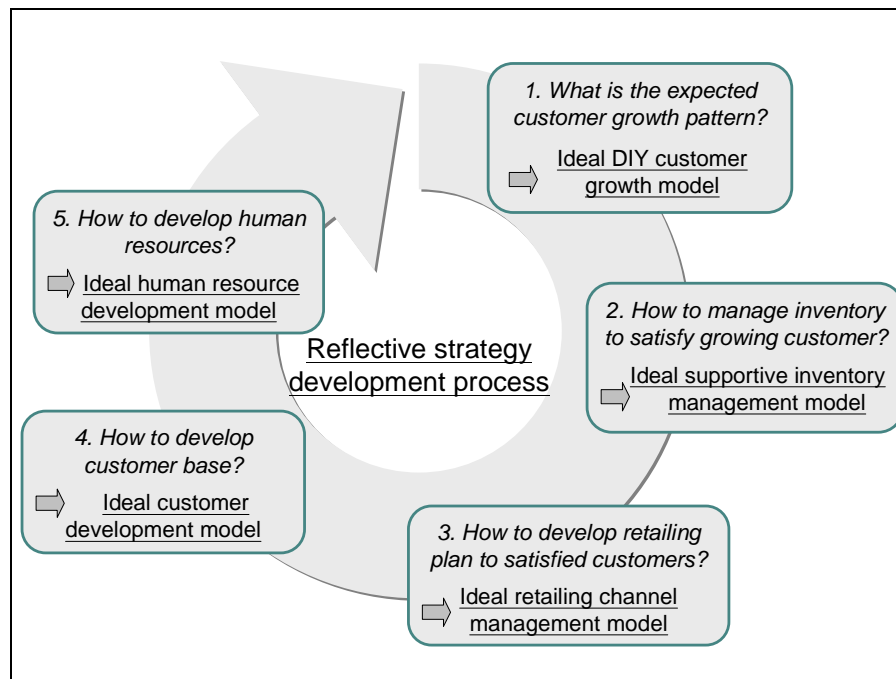

Figure 4 The reflective growth strategy development process at MeiK

Question 1: What is the expected customer growth pattern?

To picture the ideal DIY market growth pattern, the research project team firstly asked a series of questions: who are MeiK's target customers? Where are they from and how do they change in the DIY market? What drives the customer to purchase

MeiK's products? The "flow" of MeiK's DIY customers was identified and relevant statistics data, industrial reports from government and regulators, *etc.* were collected to build up an ideal DIY customer growth model. Simulation and experiments showed that a rapid growth followed by stagnation was avoidable due to market saturation. Two variables were identified to be the most critical to foster expected growth, that is, *Loyal Customers* and *Customers Recommending MeiK*.

Question 2: How to manage inventory to satisfy customer growth?

To satisfy the expected customer needs, the project team moved forward to the critical role of inventory management and discussed the most appropriate way in managing inventory. The project team identified inventory requirements for customers from different sources and analyzed the impact of inventory stock-out on customer flows. The project team focused its attention on the management of MeiK's inventory at first but soon realized that the inventory management at retailing site was as influential as MeiK's inventory in satisfying customer orders. Besides, shipment delays and ordering adjustment time also led to unavoidable unfulfilled customer requirements accompanying with rapid customer growth. Using the SD model as a discussion and inquiry platform, the project team designed inventory replenishment polices for MeiK and retailers respectively.

Question 3: How to develop retailing plan to satisfy customers?

Since most MeiK customers bought DIY products *via* retailing channels such as hypermarkets, the number and the distribution of retailers who bought products from MeiK and sold the products to consumers were critical. At this stage, MeiK decided its management objective of retailing channels, including the expansion speed and the distribution of retailers. Rather than the build up of new customers or increase the sale volumes, customer satisfaction was recognized to be the most important objective of channel management. Accordingly, channel expansion plan was expected to support easier and more convenient customer purchase. MeiK's distribution plan of retailers was designed to be consistent with the distribution of MeiK's held marketing activities to serve customers who were newly attracted. The project team modeled and added the channel management design onto the prior ideal inventory model.

Question 4: How to develop customer base?

Though car fan clubs and communities were already known to be the most important sources of customers, community relationship development was so difficult that arguments about the best way to enlarge customer base via downstream retailers or car fan clubs had been existed for a long time, leading to a frequent change of sale

forces allocation policy. At this stage, the project team added the design of community relationship development to the prior model and then simulated the model with multiple experiments. Multiple experiments showed that the build up of more club and community relationships was critical indeed to increase the opportunities for effective marketing activities to generate customers. However, to maintain a certain degree of community relationship, MeiK had to invest enough human resource to avoid the lost of community relationships.

Question 5: How to develop human resources?

The project team observed that *average work experience* and enthusiasm of salesmen were the most important factors that determined that performance of salesmen in developing and maintaining channel and customer relationships. Salesmen with more successful marketing activity experiences showed a relative high enthusiasm than those who had more failure experiences. Besides, salesmen with more work experiences had greater capabilities to keep themselves in good working status so that their enthusiasms on work could be sustained. *Average Work Experience* of salesmen was influenced by three factors: training, learning from work, and salesmen's enthusiasm that influenced the motivation towards learning. Based on these observations, the project team modeled the human resource flow and its relevant impacts on the retailing channel management and customer base. With the understanding of how salesmen worked, the project team conducted experiments of various human resource policies regarding to investments on recruiting and training and observed the financial outcomes with different human resource development policies. At the end of this stage, a system dynamics model representing MeiK's growth logic was completed.

6. Discussions and conclusion

Along the growth model development process, project team members gradually developed their confidence to the evolving growth model and achieved a high degree of consensus on the designed growth logic. They developed a more and more clear picture about the targeted market and identified the best growth pattern they could possibly achieve. Project team members enhanced their understanding of how inventory management and channel management impact on the expected growth. The team broadened the scope regarding to inventory management and realized the impact of unavoidable time delays on customer growth. Channel relationships, inventory management, customer service, and human resource management that were not so clear to MeiK and discussed separately before were gradually linked together via the

reflective strategy development process. MeiK even started to look for ways to collaborate with downstream retailers to increase supply chain efficiency for a better customer service. With the support of system dynamics modeling process, obscure assumptions and various proposed management decisions and actions were experimented to support rich and deep discussions. In Figure 5, it shows a simplified causal loop diagram of MeiK's designed growth model after the reflective growth strategy development process.
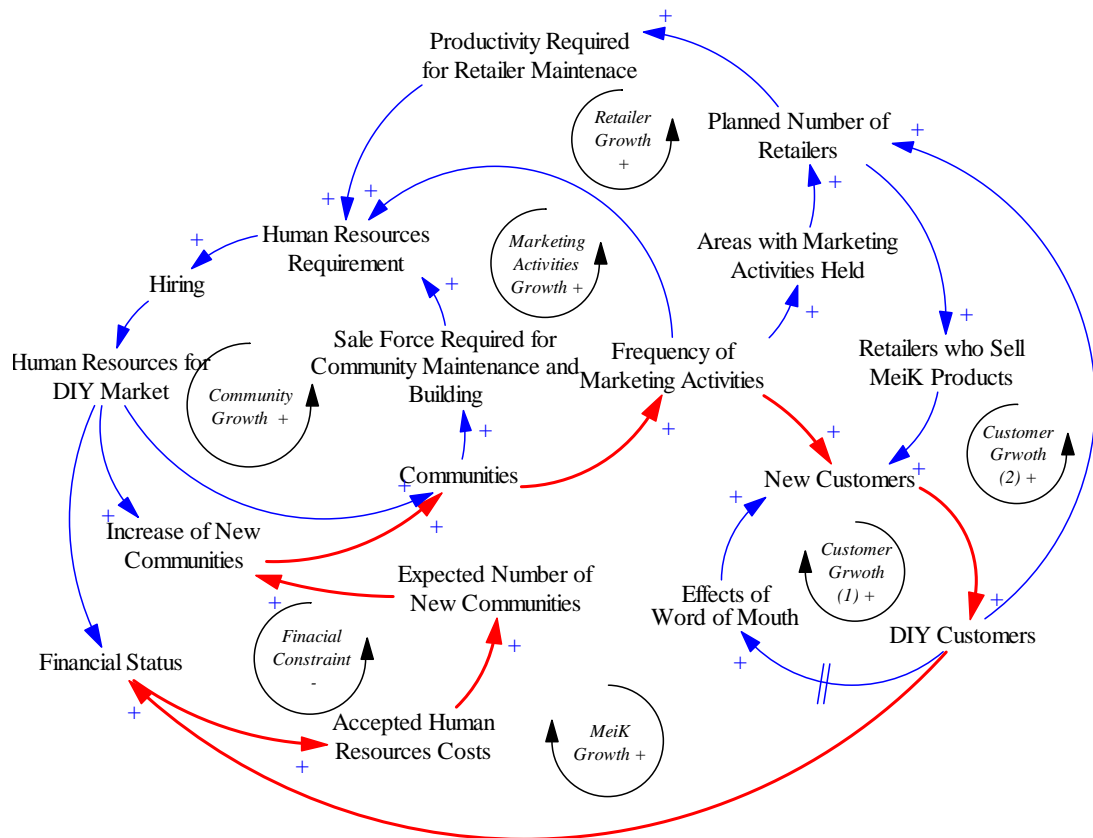

Figure 5 The designed growth model at MeiK Co.

Eight months after the research project, authors of this paper revisited MeiK to check how the developed growth model worked. The management team of MeiK Co. told the authors that they had employed the model as a discussion platform. They had implemented strategies based on the understanding acquired from the research project. Profit, revenues, and employee satisfaction were all increased. The developed growth logic and model was printed out and posted on the wall in the meeting room.

As stated in the section of Introduction, to system dynamists, this research suggests a system dynamics modeling application that is different from typical system dynamics research procedures. Typical system dynamics modeling procedures are often done in cases with existing system structures. In exploring firm growth, existing firm growth logic and implemented strategies are modeled by qualitative or

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quantitative methods to describe the experienced growth pattern of the firm. This research assumes that in many occasions, however, the growth strategies employed by a firm may evolve over time; namely, managers adjust and change their growth strategies when an implemented strategy does not work well. The lack of stable growth logic not only makes the system dynamics modeling difficult but also leads to a more difficult challenge for managers as reflective practitioners (Schön, 1983) to deliberately design sound dynamic structures for firms to grow. The proposed reflective strategy formulation process is illustrated and shows how to apply system dynamics modeling to facilitate managers to organize and develop firm growth logic. More applications and observations on how the reflective strategy formulation process supports the reflective learning process in strategy management are suggested for future research.

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