systems

MDPI

Article

Fostering the "Performativity" of Performance Information Use by Decision-Makers through Dynamic Performance Management: Evidence from Action Research in a Local Area

Vincenzo Vignieri [1,*] and Noemi Grippi [2]

[1] Department of Business and Law Studies, University of Siena, 53100 Siena, Italy
[2] Department of Political Sciences and International Relations, University of Palermo, 90100 Palermo, Italy; noemi.grippi@unipa.it
* Correspondence: vincenzo.vignieri@unisi.it

Abstract: A local area configures a socio-economic system in which several institutions interact. As stakeholders hold different values and perhaps conflicting interests, managing local area performance is a dynamic and complex issue. In these inter-institutional settings, performance management may help address such complexity. Traditional performance management approaches, mostly based on static and linear analysis, fail to capture the dynamic complexity of local-area performance, bounding decision-makers' mindsets to an organizational view of performance. Overcoming such limitations requires methods oriented to grasp a better understanding of the social reality in which their institutions operate. This contribution aims to illustrate how the Dynamic Performance Management (DPM) approach may foster a "performative" (We are indebted to Maria Cleofe Giorgino and Federico Barnabè, who illustrated the "performative" potential of "calculative practices" at the Workshop "*Le sfide della sostenibilità. Profili aziendali e giuridici*" organized by the Department of Business and Law Studies at the University of Siena, 11 October 2023. Such a perspective on the "performativity" of performance information use has remarkably enriched the conceptual positioning of our paper) use of performance information by decision-makers in inter-institutional settings. To this end, the article highlights the importance of designing conducive learning settings (i.e., action research enhanced by a system dynamics-based interactive learning environment) to support decision-makers make such a cognitive leap. Drawing from empirical evidence on destination governance studies, the article shows that enriching performance management with system dynamics modeling may help decision-makers to reflect on key issues impacting local area development, sparking a discussion on potential actions to balance economic, social, and competitive dimensions of performance. Findings reveal that DPM insight modeling holds explanatory and communicative potential in real forums by providing decision-makers with an understanding of the means-end relationships linking strategic resources to outcomes through value drivers. The use of such performance information can help local area stakeholders to (re)conceptualize the social reality in which their institutions operate. By acting as a "maieutic machine", DPM fosters a shift from an organizational and static to an inter-organizational and dynamic view of local area performance. Implications of the study include the opportunity to provide training to strengthen the active use of performance information by decision-makers in inter-institutional settings.

Keywords: performative accounting; performance management; system dynamics; interactive learning environment; action research

check for updates

Citation: Vignieri, V.; Grippi, N. Fostering the "Performativity" of Performance Information Use by Decision-Makers through Dynamic Performance Management: Evidence from Action Research in a Local Area. *Systems* **2024**, *12*, 115. https://doi.org/10.3390/systems12040115

Academic Editors: Mitsuru Kodama and Wayne Wakeland

Received: 20 February 2024
Revised: 18 March 2024
Accepted: 22 March 2024
Published: 28 March 2024

1. Introduction

Despite their wealth of historical and cultural assets and a solid business base, regions, cities, and local areas may experience socio-economic issues, such as economic downturns, marginalization, depopulation, and neighborhood blight. For the organizations located in the area, dealing with such issues entails accommodating different policy goals (e.g., improving public services for residents vs. tourists), which might imply patterns of trade-offs in time and space, originating from conflicting interests (e.g., quality of life vs. economic growth) concerning what would be the object of viable courses of action, how to implement them, and which shared strategic resources of the area (e.g., natural and historical resources, image of the area, and local traditions) should be leveraged [1]. This is the domain of performance management [2–6] for local areas.

However, traditional approaches to performance management prove inadequate to capture the complexity of the socio-economic contexts, providing limited methodological support and being mainly suitable for calculative, static, and linear analysis [7]. If local-area decision-makers misperceive the dynamic complexity of the context in which they operate [8–10], the policies they are bound to implement may hide unintended side effects, bearing dramatic consequences eventually leading to local-area decline [11–13]. Performance management routines should provide decision-makers with the means to counteract this phenomenon, especially in inter-institutional contexts where performance may be endangered by the rise of opportunistic behaviors [14], replacing choral efforts toward shared goals [15]. To face such inertial and hidden risks, performance management may support stakeholders in pursuing shared performance outcomes for the local area [16]. Also, informal control mechanisms could activate communication, learning, and coordination processes [17,18] that are critical to balancing roles and power and managing resource distribution in the local context. This may help prevent—or at least limit—conflicts and discord among local-area actors [19], which might emerge from a misalignment between institutional and inter-institutional goals and strategies [20,21].

To enrich performance management, especially at the inter-institutional level, we suggest bridging two research domains that are traditionally kept separate. In our view, the literature on performance management could benefit from scholarly investigation into system dynamics. Performance management provides local-area stakeholders with practices to account for results under different perspectives, incorporate measures into decisional rules, and use performance information as a basis for analysis and discussion through communicative acts [22,23]. A system dynamics (SD) methodology helps local stakeholders to get a grip on the dynamic complexity of the socio-economic context in which they operate through causal maps, which may be turned into simulation models capable of triggering significant learning processes. We deem that the interplay between performance management and system dynamics modeling could provide decision-makers with better support to put forward their efforts toward the sustainability of their organization and contribute to the development of the local area in which such organizations operate. Such a research domain is referred to as Dynamic Performance Management (DPM) [24] to stress that managing performance in complex systems entails framing the structural relationships between resources and performance over time [25–29].

Building on this research domain, this article addresses the following research questions: (1) what role could DPM play in fostering a "performative" use of performance information by decision-makers in inter-institutional settings? (2) How can DPM insight modeling effectively combine with a system dynamics-based interactive learning environment?

To make these questions the thrust of this article, we posit the following. First, performance management practices could have a "performative" account [30] in the sense that using performance information may induce the conceptualization of a (new) reality, resulting from the mediation among plural explanations of the inherent relationships tying decisions and results [31]. We adopt the "performative thesis" [32] that regards performance information as material for debate rather than as a source of insights only suitable for improvement. Second, to exert such a role, performance management routines should act as a "maieutic machine" [33] to continue questioning currently adopted logic and assumptions and established meanings associated with performance information [34]. Third, eliciting knowledge from decision-makers' mindsets requires a conducive setting and specific training [35,36], especially when the use of performance information is absent or passive [37–39]. Fourth, interventionist strategies (e.g., action research) may be helpful in training decision-makers on using performance information to challenge their currently adopted mental models to question and change their reality through learning.

We elaborate on such concepts to illustrate how a dynamic approach to performance management may foster a "performative" use of accounting information. In line with this view, we position DPM as a "performative" practice at the core of action research, which harnesses a system dynamics-based interactive learning environment (hereafter SD-based ILE) [9,40,41] as a virtual tool for simulation. This is to leverage "the capacity of humans to reflect, learn, and change" [42] (p. 180) if involved in iterative and dialogic sessions of causal performance analysis [36,43–45].

From an empirical perspective, this study draws from previous works focused on destination governance [16,46]. After the introduction, the paper is structured as follows. Section 2 discusses the challenges of managing performance under dynamic and complex conditions to introduce a "performative" perspective of performance information use. This sets the stage for illustrating the need for a proper method to frame the causality tying performance to resources. In line with this need, Section 3 illustrates how blending system dynamics and performance management sustains the "performativity" of performance information use. This is done by introducing the DPM framework. Then, Section 4 considers challenges in the design of SD-based ILEs. This is to pave the road for the empirical part of the paper, which, in Section 5, provides evidence of action research in the local area by enlightening the components of the SD-based ILE, the structure of the simulation model, the action research process, and simulation outputs. Section 6 discusses the role of DPM in fostering the "performativity" of performance management in local areas. Conclusions, implications, and future research directions are provided in Section 7.

2. Performance Management in Local Areas under Dynamic and Complex Conditions: A Performative Perspective to the Use of Performance Information

In the public sector, performance has been debated "as long as the government itself exists" [6] (p. 493) because it captures the essence of the intricate relationship between the political grand design and what is actually delivered to the administered community in terms of value containers, including rules, policies, and services [22,47–50]. Different interpretations of performance can be found in the literature, especially within the public administration field. In this work, performance is regarded "as a set of information about achievements of varying significance to different stakeholders" [51] (p. 147). This definition extends the scope of managing performance beyond investigating the means–end relationship that makes results contingent on resources. It calls for the active engagement of stakeholders in learning forums [43] and dialogues [5] to develop a "shared theory of change" [52] (p. 63) that might necessitate defining new goals, changing implementation actions, setting alternative measures, and adopting different standards to appraise and assess results.

That is possible if, in a local area, policy-makers and their stakeholders configure "a system that generates performance information through strategic planning and performance management routines, and that connects this information to decision venues, where, ideally, the information influences a range of possible decisions" [53] (p. 5). Such orientation emphasizes that performance management routines at the inter-institutional level should operate as a methodological process to discuss results, distribute information for decision-making, and support learning and improvement [54]. This parallels the "performative" [30] view on the use of performance information, granting accounting practices the power to trigger changes in the social system where the information they provide is being used [55]. Such a view extends the "functionalist" [56] perspective, stressing that accounting, including performance management routines, is a "device for decision-making and control" [32] (p. 181). From a performative orientation to performance management, information is not a mere output of measurement practices. It is a source of knowledge "luring actors into doing new things by their ability to inspire them to ask new questions and to see new opportunities" [55] (p. 31). From this perspective, performance management routines can be harnessed as an "engine" [57] for change within learning forums specifically designed to involve different actors with a stake in local-area performance [46].

However, as a local area configures a socio-economic system in which a plurality of individuals, groups, and institutions interact, stakeholders' behaviors and the world around them change in response to the propagated effects of each individual decision. Such changes and responses originate from the relationship between system structure (i.e., relevant local-area variables) and its resulting behavior (i.e., local-area performance). Framing how a change in the structure affects behavior is not an easy task for local-area stakeholders. This is because feedback loops govern the system, making relationships "nonlinear, implying a shift in structural dominance, influenced by past decisions, adaptive, counterintuitive, and policy resistant" [58] (p. 22). Such dynamic complexity challenges actors' ability to understand the causality connecting decisions to outcomes, voiding the materiality of performance information. If local-area policy-makers and their stakeholders are not able to develop an interpretative scheme to analyze results, the collective process of sensemaking [59], which is the basis of learning, fails to frame the causal structure underlying local-area performance dynamics.

This is because decision-makers' mental models are based on "probabilistic" cognitive heuristics [60], which prove inadequate when complexity conditions far exceed their operationalization capacity [61,62]. "Learning in and about complex systems" [63] requires that performance management methods and tools disentangle the causality tying local-area performance with the underlying system structure that can be held responsible for the observed dynamics. Traditional performance analysis typically takes a system perspective, looking at the system as a whole rather than just the sum of individual components. However, commonly adopted methods are flawed, largely due to an over-reliance on cost–benefit analysis or indicator-based performance evaluation, which privileges technical aspects to the detriment of systemic issues impacting overall system performance [64,65], which rather require debate and comprehension. In fact, comparing only the costs and benefits associated with specific initiatives may underestimate some critical impacts since they are appraised through the financial module [66]. Also, indicator-based performance evaluations are good for comparative analysis and league tables but are inadequate for causation analysis since integrating multiple aspects of performance into a single index is detrimental to the selectivity and materiality of information [67]. As "indicators do not drive policies" [68], they do not help stakeholders assess how their policies impact performance.

This requires that performance management methods embody the interpretative attitude of accounting as a social "practice for understanding organizational reality [. . .] and systems designed to account for that reality" [69] (p. 444). In fact, measuring performance without using the information to (re)conceptualize the social reality in which stakeholders operate would downgrade performance management routines to a mere technical stance, implying a passive use of measures [70] (p. 120). Implementing the performative role of accounting through "robust cause-and-effects models" [71] (p. 23) may help policy-makers and their stakeholders frame how different decisions of local-area governance impact inter-institutional performance. To this end, enriching performance management routines with simulation models that serve as boundary objects [72] (p. 23) helps local-area stakeholders make a cognitive leap [73]. A system dynamics methodology could provide a critical contribution to learning in performance management.

3. System Dynamics for "Performative" Performance Management

Grounded in "Information-Feedback Control Theory" [74] (p. 14), the SD methodology adopts computer-based simulation models to foster an understanding of the deep causes of a dynamic and complex problem. In SD, the concept of feedback loops is of utmost importance since it captures the underlying causal relationship that links problem structure to system behavior. In fact, "complex behaviors usually arise from the interactions (i.e., feedback) among the components of the system, not from the complexity of the components themselves" [58] (p. 12). In complex systems, a feedback loop is a mechanism wherein information generated by an action moves through the system structure and eventually returns to its point of origin [75]. This information, in turn, influences future courses of action in the sense that positive loops produce tension to reinforce (R) the cause (i.e., exponential growth or collapse), while negative loops balance (B) or limit the initial action (i.e., goal-seeking behaviors or inertial decays). The interplay between reinforcing (R) and balancing (B) loops "gives the complex system much of its character" [76] (p. 108). Delays and non-linearities among the variables in a feedback loop amplify shifts in loop dominance.

The core of SD modeling lies in capturing the causal relationships that exist between the fundamental elements of a social system, comprising the variables stocks (i.e., structural resources) and flows (i.e., performance). As Forrester [74] introduced, such modeling methodology enables a holistic approach to understanding complex social systems, such as the governance of local-area performance. From a performance management perspective, the causal connection between stocks and flows describes how decision-makers continuously convert information into decisional rules that incorporate values, expectations, goals, and tensions and assess the gap between actual and desired conditions [77]. Such streams of decisions lead to actions changing the system structure to improve its behaviors [78].

SD offers a representation of complex issues through models, which can reproduce the problematic behaviors under investigation and are suitable for system inquiries [79]. Models are considered reliable and valuable tools to foster decision-maker learning [63,80,81] as they frame the underlying accumulation and depletion processes of strategic resources that critically influence system performance.

Such a systems approach underpins the DPM methodological framework [24]. DPM helps local-area decision-makers to go beyond a static view of the system and short-termism, as it supports them in (1) outlining the expected end results, (2) causally relating the corresponding performance drivers, and (3) setting different policies that local-area policy-makers would adopt to build up and deploy the strategic resources required to affect such drivers. By merging stock and flow structures and feedback analysis through insight models, DPM is able to frame the most crucial cause-and-effect relationships linking resources to performance. That is because "small system dynamics models are unique in their ability to capture important and often counterintuitive insights relating behavior to the feedback structure of the system without sacrificing the ability for policymakers to easily understand and communicate those insights" [82] (p. 23). To this end, DPM insight models develop such analysis through a three-layer structure (as portrayed in Figure 1): end results, performance drivers, and strategic resources. By focusing on end results, decision-makers can detect the "performance drivers", i.e., the critical success factors that impact them. Such drivers are relative measures comparing the current endowment of a critical strategic resource to a reference value. In this way, such ratios are essential in DPM analysis because performance drivers connect expected outcomes with the resources deemed critical to attain the desired result. If such measures are well-designed, they can capture subtle variations in the endowment and mix of the currently available strategic resources to inform decision-makers about the need for corrective actions.

From this perspective, DPM insight models can assist decision-makers in evaluating the deep causes of a problem to communicate and build consensus on them rather than focusing on symptoms [83]. The use of models to assess performance may induce "relatively enduring alterations of thought or behavioral intentions which result from experience, and which are concerned with the attainment (or revision) of policy objectives" [84] (p. 306). This may lead to "an improved understanding of causal relationships in the light of experience" [85] (p. 71).

As illustrated in the previous section, if performance information is discussed through communicative acts in dialogic initiatives, convened stakeholders can harness the performative character of such activity, implying that performance analysis can "lead to outcomes that are assessed and taken as starting points to further actions" [86] (p. 163). This may challenge decision-makers' underlying assumptions, which, in turn, encourage changes in currently adopted mental models, eventually leading to a new/revised conceptualization of the real world. In this sense, performance management is an "engine" to promote changes, not "a camera" delivering a snapshot of reality [57]. Developing such an understanding in a protected environment through computer-based simulation tools may help stakeholders experiment with the complexity of the reality under investigation.

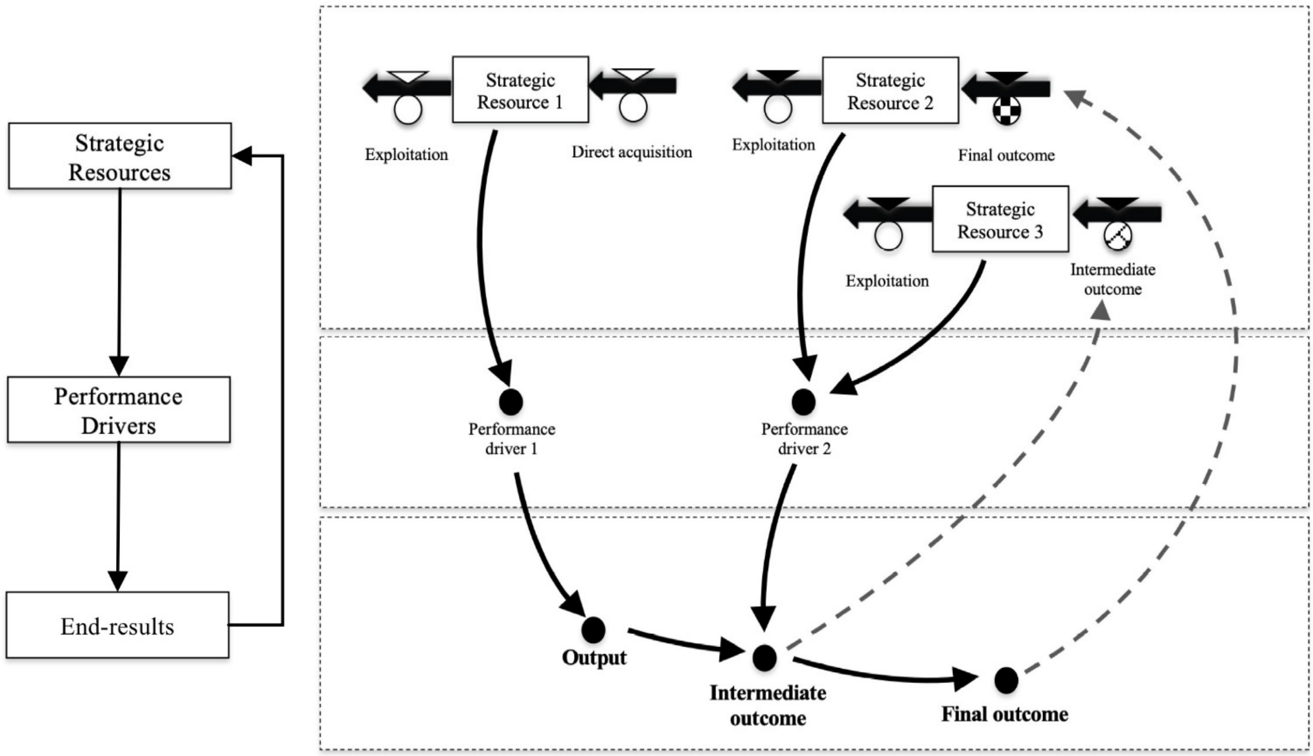


Figure 1. The Dynamic Performance Management framework [24] (p. 73).

4. Experimenting with System Complexity: Challenges in the Design of SD-Based Interactive Learning Environments

Given the dynamic complexity of a local area, using a protected environment through which stakeholders may experiment with causation analysis and reflective thoughts can be regarded as a preliminary step for enhancing the performativity of accounting practices. In fact, SD-based ILEs are designed to be used in training settings to support decision-makers' discussions about a common, dynamic, and complex problem [87]. Such an interactive tool can be regarded as a "microworld" [78,88], allowing participants to engage in decision-making, simulation, and debriefing sessions of simulation outcomes while receiving guidance from a learning facilitator [40,83].

The expected changes triggered by such practices come close to what Argyris and Schön [89] (p. 24) termed "double-loop learning". This tenet refers to "sorts of organizational inquiry which resolve incompatible organizational norms by setting new priorities and weightings of norms, or by restructuring the norms themselves together with associated strategies and assumptions". This means that "double-loop learning" in performance management encourages inquiry into and promotes changes in actors underlying decision-making norms, policies, and objectives, eventually leading to the formation of a new shared reality about the socio-economic context.

Double-loop learning builds on single-loop learning in performance management, implying that information feedback about the real work provided by measurement systems not only changes our decisions (i.e., single loop) but also affects decision-makers' mental models (i.e., double loop) [90]. Therefore, changes in strategies, structure, and decisional rules might emerge as policy-makers question their mental models thanks to the SD-based ILE.

In doing this, SD-based ILEs may help stakeholders gain a comprehensive understanding of the problematic conditions under investigation, develop dynamic hypotheses of problem structure, build a model to test assumptions through simulation, and finally assess simulation results [63,79,91]. When involved in such experimental settings, the expectation is that actors would focus their reflections on the causal relationships among their values (i.e., the rationale of decisions), policy goals, decision-making structures, and results rather than on the attained "score" of a particular decision. However, designing SD-based ILEs entails some challenges. Fostering performance analysis based on communication and discussion with the intent to promote learning through SD-based ILEs may be limited by the so-called "video game mentality", which could entrap players when in front of the screen of computer-based management simulators. This is misleading as it may induce players to attempt a series of decisions as long as the score attained is satisfactory, though it does not lead them to reflect on the underlying causality linking the key variables [92,93]. If the SD-based ILE conceals the causation theory expressed by the model, the expected changes in the social reality of decision-makers will not be attained due to the flaws in using performance information for analysis [94–96].

To be effective, SD-based ILEs should enable players in front of the screen to approach performance analysis as a practice to understand the discrepancies between their desired effects and actual simulation results. To this end, the model should allow them to change certain assumptions, record decisions, and visualize the new simulation results in light of altered decisions. This practice of performance analysis may encourage decision-makers to develop a causation theory that identifies effective leverage points on which to act to change the system structure and influence local-area performance toward the desired goals.

In this sense, using SD-based ILEs may be a first step for moving from a functionalist to a performative view of performance management routines. The measurement, incorporation, and use of performance information are instrumental in identifying potential areas of improvement [23]. In addition, such practices can support "actors collectively examine information, consider its significance, and decide how it will affect action" [36] (p. 167).

However, using SD-based ILEs in the illustrated direction requires a process. Action research could provide a fruitful interventionist approach in this regard, as it involves decision-makers in an iterative process aimed at maturing a dynamic hypothesis of the problem structure, testing policy assumptions, and evaluating simulation results through communication and reflection. In a real setting, going through such an iterative process [97] is oriented toward improving currently adopted practices [87,98] in the context where they are being used and with the involvement of the key players.

5. Using an SD-Based Interactive Learning Environment for "Performative" Performance Management: Evidence from Action Research in a Local Area

This section provides evidence from action research carried out in a local area [46,99] with the intent to support key decision-makers to address a specific governance challenge: designing policies to sustain the economic development (i.e., tourism presence) of the area without disregarding social (i.e., service quality) and competitive (i.e., town image) dimensions of performance. This task was selected because the existing trade-offs among such goals may intensify the need for coordination in designing sustainable policies for local areas, which is ingrained in our discussion on the contribution of the "performativity" of performance management in inter-institutional settings. In fact, when the authority is dispersed and "responsibility is diffuse" [100] (p. 144), local stakeholders may need shared venues [36] to discuss issues, capture opportunities, solve problems, and eventually obtain results [101]. Not infrequently, when designing policies to foster economic development, divergences are likely to arise if the goals of businesses take over those of residents [1]. In this context, inter-institutional performance management routines may support the local actors in putting forward their efforts toward the lifelong endurance of their organization to contribute to the development of the local area in which such organizations operate.

To prepare our discussion on how DPM methodology fosters the "performativity" of performance management practices (in Section 6), the following sections illustrate the components of the SD-based ILE (i.e., the formal SD model and the interface), the action research process in which the tool was used, and the simulation outputs.

5.1. The Model Structure as a Causal Loop Diagram

For the sake of clarity in illustrating the structure of the model, the main feedback determining model behavior is portrayed in Figure 2 as a causal-loop diagram [75]. Detailed information concerning the model structure, variables, equations, properties, and units of measure are provided in Appendix A, articulated in model modules. The purpose of the model is to capture the main relationships affecting three key results domains in a governance context: economic performance (i.e., tourism development), social performance (i.e., service quality), and competitive performance (i.e., town image). Initial values for key variables and parameters, as well as the flow equations representing real-world decision-making rules, were based on primary sources of information [77], i.e., interviews, budgets, and consolidated inter-institutional agreements [46].

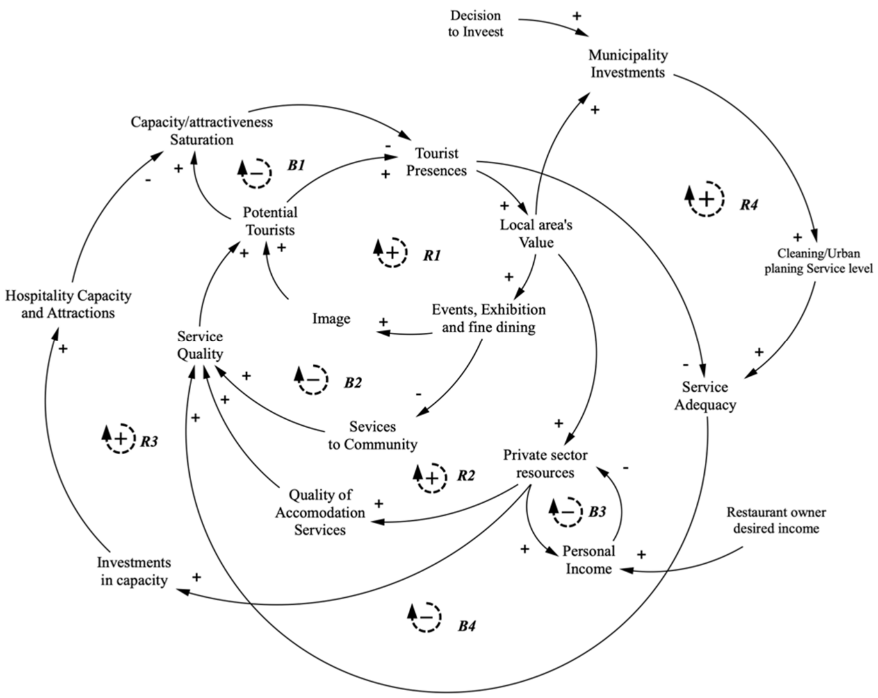


Figure 2. A causal loop diagram representing the SD model feedback structure [20].

The model is structured in four sectors, three of which are associated with the involved players, i.e., the municipality, museum, and businesses, while the fourth hosts a set of shared resources for the local area (e.g., the image of the town, tourism presence, quality of life) and common goods (e.g., natural environment).

Loop R1 describes a process through which cultural events and fine dining drive town development and improve the image of the place, leading to the further exploitation of tourism potential as a source of value for the whole area. Also, tourism presence is sensitive to service quality. Based on this idea, business owners may decide to invest in improving the quality of accommodation services, reinforcing the tourism potential of the area (R2). Tourism development (loops R1 and R2) may find a limitation in local-area capacity, as portrayed by loop B1, and the fact that diverting the municipal budget from community services to events production may cause a decline in local-area service quality

(B2). Whenever there is an increase in tourism presence, service adequacy decreases if decision-makers fail to increase the level of cleaning and urban planning services, for example. Municipal investments in service adequacy (R4) and private sector investments in hospitality capacity (R3) can both mitigate the effects of balancing loops, though the latter loop encounters a limit in the desired personal income by business owners (B3), which depletes business resources.

5.2. The Interface of the ILE

The ILE was built with iThink 10.0.6.[1] SD simulation software. It consists of a computer-based simulation tool running behind a user-friendly interface, enabling lay actors to interact with the underlying SD model. The interface of the ILE was designed to mirror the real-world decision-making settings for each player involved in the action research to increase confidence in the tool. The causal loop analysis illustrates that intricate relationships exist among the four sectors. For instance, if the mayor diverts municipality funds from cultural events to road maintenance, the museum budget decreases due to a reduction in direct funding, and as a result, there would be a negative impact on museum ticket revenues. Also, business profits would suffer due to the drop in the town's attractiveness for tourism.

As Figure 3 shows, each decision-maker has a dedicated control panel portraying policy levers on which to act to gradually change certain model parameters (e.g., decide what fraction of the budget to invest, the number of exhibitions per year, or the markup on the products). Also, through knobs, the interface allows players to activate/deactivate automatic decisions if certain circumstances occur.

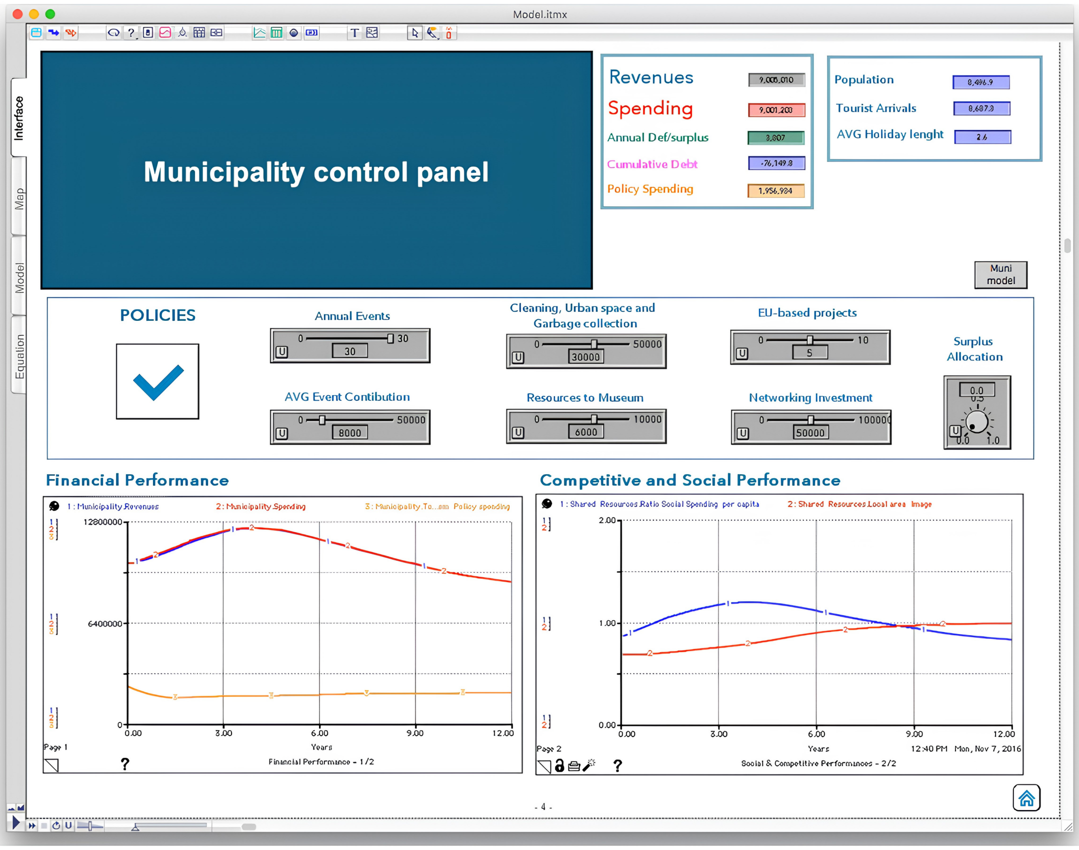


Figure 3. An example of the ILE control panel.

A detailed inventory of available policy levers that can be used by each decision-maker is provided in Table 1 alongside units of measure and a short description.

Table 1. Policy levers available for the decision-makers with the unit of measures and short descriptions (Adapted from [16], (p. 88)).

	Policy Lever	Unit of Measure	Description
Businesses	New investment switch		Decision rule to invest in expanding the business capacity
	Fraction of bank account to invest	%	Fraction of new investment financed through business funds (the rest fractioned through the back loan)
	Maintenance reduction fraction	%	Percentage of obsolescence tolerated by the owner
	Personal income	EUR/year	Financial withdrawals per year as business owner personal income
	Networking expenses	EUR/year	Resource invested in flyers and projects with local partners
	Working days per year	days/year	Average number of working days in a year
	Mark-up	dimensionless	Ratio between the price and its cost
	Unit price	EUR/customer	Average price paid per customer
Museum	Project with school	N° of projects	Number of projects run by the museum
	Surplus allocation	%	Fraction of cumulative surplus (if any) to current expenditure
	Networking expenses	EUR/year	Resource invested in flyers and projects with local partners
	Concerts	N° of concerts	Number of concerts organized on average by the museum
	Pre-concert contribution	EUR/concerts × year	Average resources spent per concert per year
	Exhibitions	N° of exhibitions	Number of exhibitions organized on average by the museum
	Pre-exhibition contribution	EUR/exhibition × year	Average resources spent per exhibition per year
Municipality	Surplus allocation	%	Fraction of cumulative surplus (if any) to current expenditure
	EU-based projects	N° of projects	Number of projects through which apply for EU call for tenders
	Resources to museum	EUR/year	Supply of funds to museums
	Cleaning, Urban space planning, and Garbage collection	N° of people	Level of services provided to keep the local area clean, well-organized, and safe
	Events	N° of events	Number of cultural and touristic events hosted on average by the municipality
	AVG event contribution	EUR/event × year	Average supply of funds per event per year

Usages of the policy levers reported in Table 1 include an initial stock value, planned investment magnitude, desired goals, service prices, or the timing of specific actions, such as service delivery time or information update time. Made as individual decisions, actions on such policy levers alter the model's structure, thereby impacting simulation outputs. For instance, the museum director could set a no-debt policy forbidding the institution to borrow money to sustain its institutional mission. In a similar manner, business owners could automatically set the model to renovate or not renovate structural assets as they are entirely depreciated (i.e., they get to the end of their expected productive life). To support players in their decision-making process, performance information concerning key variables for each sub-system is plotted in graphs or shown by numeric displays (e.g., taxation revenues, business profits, tickets sold), denoting how changes in the model structures impact systems' behavior.

The ILE was also set to store all simulation outputs and players' decisions on a spreadsheet, which served as a discussion basis for debriefing as it gave the opportunity to contrast participants' exposed ideas to their actual decisions recorded by the ILE. As illustrated in the next section, such comparisons and contrasts informed the whole action research process.

5.3. The Action Research Process

The action research took place in a 2-day workshop and involved the mayor, the local museum director, and a business owner from the hospitality industry (restaurant) in two sessions of 4 h, supported by two learning facilitators. To involve them in a conducive learning environment, the research team used specific scripts to trigger decision-makers' reflections [101] on specific tasks. First, they were asked to identify the main issues affecting local-area performance. This sets the stage for problem ownership by the local players. Then, in debriefing sessions, participants had the opportunity to frame such issues, share their explanations based on real-world experience, analyze simulation outputs, discuss findings, and illustrate the effectiveness of simulated policies against their actual decisions. In fact, action research helps decision-makers develop knowledge as the spiral of "problem diagnosis à planning initiatives à taking actions à evaluating the results" unfolds [102]. This process allows decision-makers to refine their mental models through iterations.

The interventionist initiative consisted of two iterations, composed of several steps. First, the team of facilitators surveyed local actors on perceived discrepancies between desired and current conditions in certain critical domains for local-area development. The survey results paved the road to the first plenary session, during which participants shared their "hopes and fears[2]" about future local-area development [104] and the critical variables of concern for them. In this way, they were introduced to the first round of decision-making and simulation, executed in a non-collaborative mode.

Second, each decision-maker individually used the ILE, paying attention to recording adopted decisions, motivation, and expected outcomes on a notepad. Individual decision-making resulted in three separate runs, which were addressed in specific debriefing sessions during which each decision-maker was asked to assess simulation outputs against stated assumptions (i.e., adopted decision, motivation, and expected outcomes written on the notepad). As a follow-up to individual simulations, the research team distributed a second survey in a plenary session to document performance discrepancies registered by each player. Also, to animate reflection among players, individual runs were compared to one another. The benefits of such exercise consist in the fact that for each individual run, one player was a local-area decision-maker, while, for the other two, the model adopted a non-collaborative set of "self-serving" decisions predetermined by the research team. By simulating in a non-collaborative environment, each decision-maker found it hard to improve both organizational performance and local-area performance. Such an austere condition was decided to bend decision-makers' mindsets toward collaboration in planning for local-area development.

Third, in a plenary session, a dialogic form of performance analysis was carried out with the intent to identify the main logical relationships among performance determinants, value drivers, and performance outcomes [16,20]. Using an outcome-oriented DPM approach [24], the causality between resources and performance was translated into a preliminary DPM insight model reflecting ongoing players' understanding of cause-and-effect relationships affecting local-area outcomes.

In the second simulation round, the SD-based ILE was set in collaborative mode, implying that the three decision-makers played with the model together and could discuss their decisions before translating them into inputs for the model. Like in the non-collaborative simulation mode, each player recorded adopted decisions on the notepad. Once the simulation ended, participants were asked to evaluate the outputs of collaborative runs according to their expectations and the causality embedded in the early draft of the DPM insight model. Using performance information resulting from the simulation, the participants revised the DPM insight model with the support of the research team. As a result, the emerging insight model was used as a performance analysis tool for the final debriefing session.

5.4. Simulation Outputs

As illustrated in the previous section, two rounds of simulations were performed in two alternative modes: (1) non-collaborative and (2) collaborative. To consider the long-term effects of adopted decisions, the simulation was set at a 12-year time horizon, which was split into four intervals of 3 years. Players made decisions, and then, for each subsequent interval, they were asked to confirm or change some policy aspects as they received performance information from the graphs displayed in the control panel.

In the non-collaborative simulation mode, players interacted with the model individually. Though the task was balancing economic, social, and competitive domains of local-area performance, they failed, since the model loaded a set of "self-serving" decisions for two players who were not playing with the ILE. The mayor prioritized gaining consensus from the local business community by investing in events and activities to boost town tourism appeal rather than planning the infrastructural development that could benefit residents. The museum director took a conservative approach to producing cultural activity to keep the financial equilibrium under control. The business owners decided to take high dividends from business profits, regardless of key assets' lifecycles and sponsorship requests by the local museum.

Entrapped in a non-collaborative mode, the real player could not improve local performance due to the selfish policies set by the two "dummy players" that privilege short-termism and individualistic gains.

The three graphs in Figure 4 plot the simulation results of the non-collaborative mode for the mayor, museum director, and business owner runs concerning the dynamics of the three key variables: tourism presence (solid line), service quality (dash line), and town image (dotted line). In particular, tourism presence was identified as a variable of interest to capture economic performance since it cumulates tourism arrivals (i.e., outcomes) for certain days. We considered the perceived quality of services offered to the local community as a measure of social performance, which remarkably impacts the local area's quality of life. Town image was assumed to be a competitive performance dimension to indicate the "cumulative beliefs, ideas, opinions, and experiences people have about a place" [29] with respect to other similar destinations.

As anticipated in this section, each player alone could not have a chance to balance performance under the three investigated domains due to the features of the simulation mode, which unavoidably endangered performance sustainability for the three considered dimensions plotted in Figure 4, though this was in a different manner for each decision-maker.

Though players had been informed beforehand that individual efforts might only have produced a limited positive impact on local-area performance, in the debriefing session, the three players blamed their own decisions, believing they were the main cause of the unexpected negative outcomes, as reported in the notepads. The goal of the non-collaborative run was to challenge decision-makers' mental models on the idea that organizational results rely on local-area shared resources as cumulate effects of inter-institutional performance, regardless of their role and efforts in local governance.

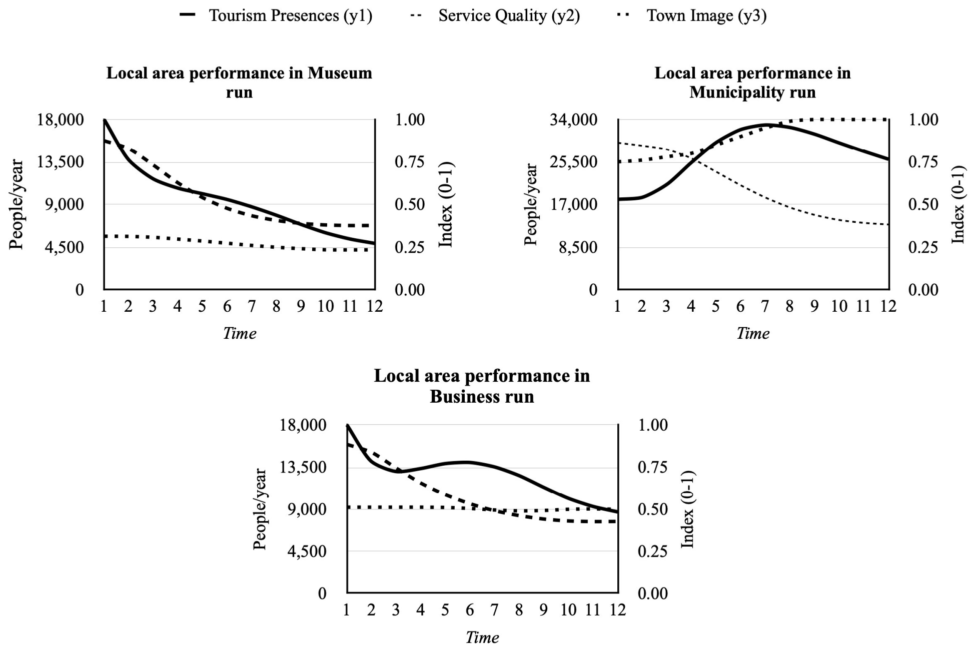


Figure 4. Results from the non-collaborative simulation mode.

Simulation outputs of the collaborative mode are shown in Figure 5. The graph shows a significant improvement in local-area performance compared to the previous runs.

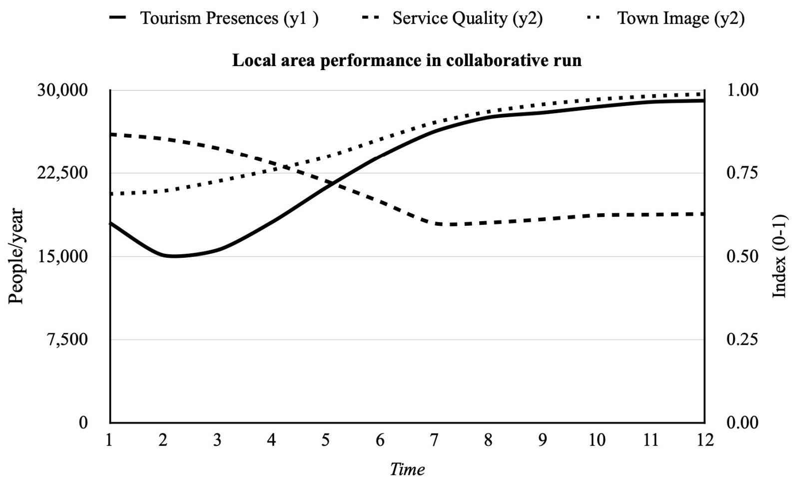


Figure 5. Simulation outputs of the collaborative mode.

Figure 5 illustrates a drop in tourism presence and service quality from years 1 to 5, with a rise in the long run. This indicates an enriched stakeholder capacity to balance service quality and town image, eventually resulting in improved local-area tourism attractiveness in the long run. Decision-makers implemented cautious policies in the collaborative mode. Using the DPM insight model as a key to critically review the expected impact of their decisions on local-area performance. The model allowed decision-makers to focus on the interactions between the three performance domains at the organizational and inter-institutional levels. Such an improvement can be attributed to the performative practice of building a robust "cause-and-effects model" to guide performance analysis in specific debriefing sessions [82].

In the concluding debriefing session, the museum director stated, "I just realized that the small-town complexity should be managed by adopting collaborative policies". In a similar vein, the mayor of the small town observed "I found that tourism planning requires collaborative policies", remarking that "so far, I haven't considered the impact of tourism growth on sanitation services and how a decrease in service capacity will sooner or later feedback on tourism performance through attractiveness. Also, this may impact business profitability".

Such findings can be taken as a sign of a gradual change in decision-makers' mental models, which implies a shift from an organizational and static to an inter-organizational and dynamic view of local-area performance, as discussed in the next section.

6. A Dynamic Performance Approach to Foster the "Performativity" of Performance Information Use by Decision-Makers in Inter-Institutional Settings

In the action research process, debriefing sessions were animated by DPM insight modeling with the intent to provide decision-makers with the tool to analyze the performance information resulting from simulations in light of recorded decisions, reflecting the currently adopted mental model.

Figure 6 shows the DPM insight model[3], which portrays three main outcomes associated with the different performance dimensions for the local area: (1) the change in tourism presence, (2) the change in town image, and (3) the change in service quality. The causality linking each performance outcome to value drivers and strategic resources is illustrated in turn.

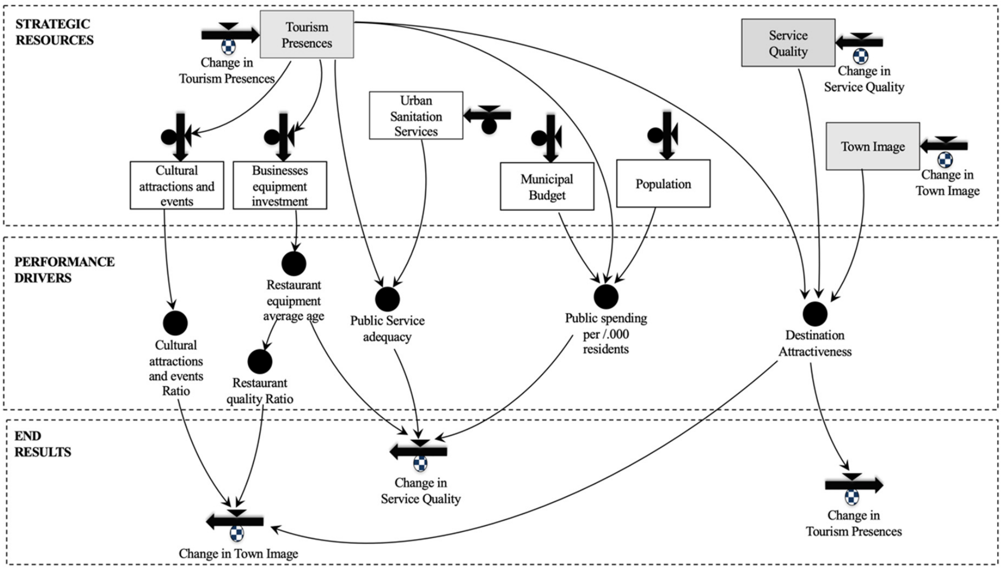


Figure 6. The DPM insight model used for the "performative" analysis of simulation outputs [20] (p. 627).

The change in tourism presence is affected by the performance driver "destination attractiveness", capturing word-of-mouth effects from tourism direct experiences in the place, synthesized by the image, and the service quality, which is the stock appreciating the level of public services provided by the municipality to tourists and residents. The cumulative effect of the changes in tourism presence results in the stock of "tourism presences", which is a vital strategic resource for the survival and growth of the organizations and the community in the area.

The change in town image varies with the corresponding strategic resource "town image". This performance outcome is affected by the performance drivers' "cultural attractions and events ratio", as a measure of cultural events density and frequency in the town, and the "businesses quality ratio", which measures the obsolescence level of business structures. The decisions made by the municipality to fund cultural attractions and events production, as well as the business investments in renovating equipment, directly affect the town's image. As the image of the town affects tourism presence, the financial requirement of public and private sector investments in this direction could find a proper source in the cash flows generated by an increase in tourist arrivals.

As previously mentioned, the "change in service quality" determines the "service quality" level in the area, which is complementary to "town image" for local-area attractiveness. Such outcome is influenced by two performance drivers, "public service adequacy" and "public spending per/.000 residents". While the first estimates the relative level of capacity adequacy, e.g., sanitation services, with respect to additional garbage, water needs, and car congestion that a growing tourism appeal could imply, the second driver reflects the political commitment to improve community quality of life through services for residents (e.g., crime prevention, assistance to households, parks, and roads maintenance).

How have DPM insight models fostered a "performative" use of performance information? DPM insight modeling helped local-area decision-makers pursue specific goals by revealing effective leverage points on which to act to affect the upstream strategic resources to influence performance drivers and improve desired performance outcomes. Such a causal perspective was central to the mediation and reflection processes among the key actors involved in the action research. That is because using performance information to source the practice of causal mapping has entailed searching for measures shaping "who and what counts" [32] (p. 183). In this sense, DPM modeling can be regarded as a performative practice that blends representation and the creation of a shared reality built on the knowledge elicited from decision-maker mindsets. In doing this, models serve as a boundary object [105], i.e., "learning vehicles that may help people create shared meaning and understand other perspectives, to foster a common shared goal" [72] (p. 20).

As the model incorporates performance management concepts into visuals [106,107] it has the power to affect the reality in which it has been produced and the mindset of those using it [108,109].

Performative effects from the use of DPM can be articulated on two levels. On the surface, instrumental use of the model supported decision-makers in improving simulation outputs, as discussed in the previous section. Performance drivers provide critical accounting measures in such a direction as they capture the fundamental means–end relationships linking resources to performance. In-depth effects regard the changes in the underlying logical reasoning of decision-makers, which have led them to extend the boundaries of their reality from an organizational to an inter-organizational perspective of performance management in local areas. In fact, during the non-collaborative mode, decision-makers minded considering organizational decisions at the root of weak results, revealing that each decision-maker framed local-area performance "from the window" of its organization. Such an organizational point of view disregards the effects of individual decisions on inter-institutional performance and how the latter contributes to building or depleting local-area shared resources, i.e., the potential to sustain organizational results in the future. "Event-oriented thinking" considers that a rising problem in a specific domain can find a proper solution only within that domain, disregarding that underlying causes may be located in other domains or traced back in time [78] (p. 32). A pictorial representation of such a bounded mindset is provided by the inner dashed section in Figure 7.

Being deceived by only an organizational point of view, decision-makers do not perceive that local-area performance influences local-area shared resource endowment, which, in turn, feeds back to their organizational decisions. The system's boundaries can be extended if organizational decisions are sourced with performance information concerning local-area performance and shared resource endowment. This requires understanding the interdependencies among decisions of other organizations operating in the context, local-area performance, and the set of shared resources pertaining to the inter-institutional setting, i.e., the outer dashed section in Figure 6. DPM has proven beneficial in helping decision-makers grasp such a system's structure, which is out of the reach of the "from the window" organizational point of view of performance analysis. As advocated in this work, it requires deepening the perspective of performance analysis through DPM to utter a “new represented reality”, which positions each organization in a much more complex inter-institutional setting.

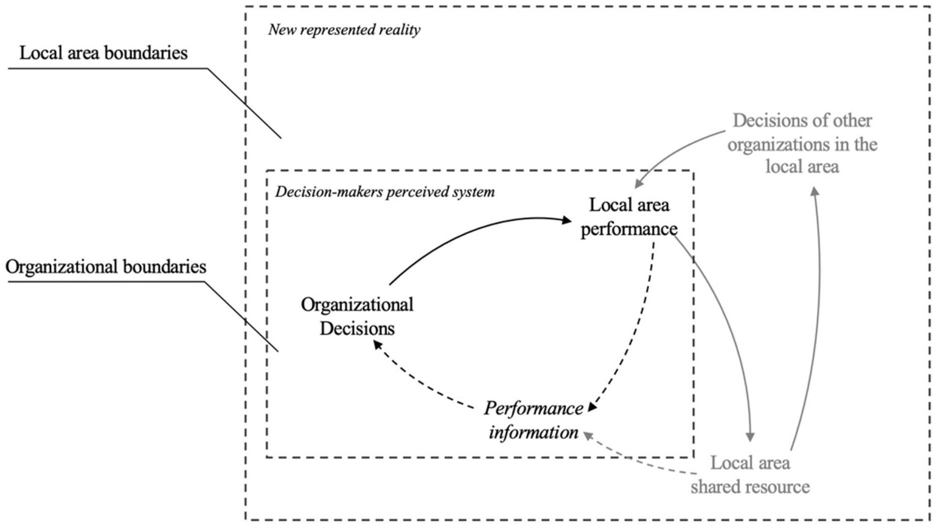


Figure 7. A pictorial representation of the performative effects of the DPM analysis.

7. Conclusions

Managing local-area performance entails dealing with complex and dynamic issues, including economic downturns, marginalization, depopulation, and neighborhood blight. In such inter-institutional settings, performance management routines may significantly contribute to addressing such issues by involving different actors whose decision-making norms, policies, and objectives are strongly intertwined. However, traditional approaches to performance management, mostly based on static and linear analysis, were proven to be inadequate for capturing the dynamic complexity of local-area performance, demanding practices that can use performance information as a means to trigger changes in the social system where the provided information is being used. To address such limitations, we suggested enriching performance management with system dynamics. In this sense, we consider such a blend beneficial to shift from a “probabilistic” cognitive heuristic to a “systemic” view. To further such a move toward a “performative” use of performance information, we advocated DPM as a framework helping local-area stakeholders make a cognitive leap, eventually leading to a new/revised conceptualization of the real world in which involved organizations operate.

In line with this stance, this article has shown how DPM can foster the “performativity” of performance information use by decision-makers in inter-institutional settings. To this end, evidence from action research in a local area has been discussed. Findings reveal that the combination of SD with performance management in conducive learning settings may trigger decision-makers’ reflections on the main issues affecting local-area development to entice a discussion about possible actions that can be carried out to balance the economic, social, and competitive dimensions of performance. Adopting an SD-based ILE activated such a reflection, which was further enhanced by debriefing sessions guided by learning facilitators through DPM insight modeling. The two rounds of simulations illustrated in Section 5 provide a quantitative account of the benefits of the proposed methodological approach, showing significant differences between simulation outputs in the non-collaborative vs. the collaborative mode. Such findings were discussed in Section 6 with the intent to address the two research questions raised in this work. With respect to the first question, DPM could play the role of a “boundary object” in fostering a “performative” use of performance information in inter-institutional settings. This is because DPM modeling helps elicit decision-maker knowledge, which can be harnessed to represent and create a shared reality. In this sense, DPM supports the creation of a shared meaning by translating concepts into visuals (i.e., stock-and-flow structures and performance dynamics), holding the power to modify the reality of performance management practices with respect to the goals, the measures, the strategy, and the people using it [108,109]. The widening of an organization toward an inter-organizational point of view of performance management in local areas provides relevant evidence in this direction. As per the second research question, DPM insight modeling can be effectively combined with an SD-based interactive learning environment since the latter provides a protected virtual setting for experimenting with complexity, while the former holds explanatory and communicative potential in real forums. The findings of this study are in line with the existing body of knowledge on the use of SD-based ILEs in decision-making settings, confirming the usefulness of such tools in challenging decision-makers' mental models in complex and dynamic domains [110–113]. The novelty of our findings lies in the focus and on the context of the empirical investigation since the majority of the studies focus on strategic issues [88] in firms [93] or entrepreneurship [114].

In addition to this, as highlighted in Section 4, our study has demonstrated that SD-based ILE design is a salient phase to prevent the potential so-called "video game mentality" which may entrap decision-makers, voiding the learning phase.

The contribution of this work enriches performance management research with a method to foster a "performative" use of performance information by decision-makers. As theoretical implications of the study, we suggest that DPM fosters the "performative" use of performance information by capturing fundamental means–end relationships linking resources—through drivers—to performance. Such relationships may support decision-makers in expanding the boundaries of their reality from an organizational to an inter-organizational perspective of performance management in local areas.

We are conscious of the limitations of our contribution, which concern the combination of DPM insight modeling and SD-based ILE design. As modeling reflects subjective assumptions about the causal structures, validating model behavior is contingent on the level of confidence and consensus on the phenomena captured by the feedback loops included in the model [80,115–117].

In line with our contribution, the study offers practical implications for performance management professionals, including the opportunity to provide training to strengthen the "performative" use of performance information by decision-makers.

We are aware that more efforts will be needed to investigate how enriching performance management with system dynamics may foster a shift from an instrumental to a "performative" use of performance information [25]. In line with this, further empirical studies may advance the development of this methodological framework, including testing other group model-building scripts oriented to elicit information concerning relevant system variables from the stakeholders convened in the workshop. Additionally, developing longitudinal research on performance management practices would be more than needed to understand the long-term effectiveness of such training initiatives. Lastly, a third research avenue may focus on investigating the interplay between performance management and system dynamics modeling to provide benefits for the lifelong endurance of organizations in synergy with their operating environment.

Author Contributions: V.V. and N.G. have equally contributed to design, research, and writing activities. All authors have read and agreed to the published version of the manuscript.

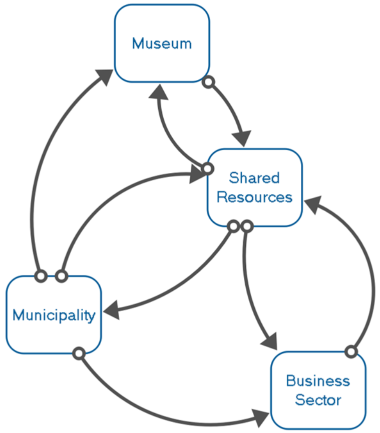
Funding: This research received no external funding.

Data Availability Statement: The original contributions presented in the study are included in the article/Appendix A, further inquiries can be directed to the corresponding author/s.

Conflicts of Interest: The authors declare that they do not have conflicts of interest in relation to the research or the involved institutions.

Appendix A. Simulation Model Overview: Full List of Model Variables, Equations, Properties, and Unit of Measures

Model modules



Business Sector

Variable Name	Equations	Properties	Units
Equipement_and_Store(t)	Equipement_and_Store(t − dt) + (Renovation − Obsolescnce_rate) × dt	INIT Equipement_and_Store = Initial_Equi_and_store_level	EUR
Hospitality_Capacity(t)	Hospitality_Capacity(t − dt) + (Construction_Rate − Obasolescence_rate) × dt	INIT Hospitality_Capacity = Desired_Capacity	bed
Loan(t)	Loan(t − dt) + (New_loan − repayment_rate) × dt	INIT Loan = 0	EUR
Long_term_Investments(t)	Long_term_Investments(t − dt) + (From_private_money + From_Loan) × dt	INIT Long_term_Investments = 0	EUR
On_ordering_Capacity(t)	On_ordering_Capacity(t − dt) + (Starting_costruction − Construction_Rate) × dt	INIT On_ordering_Capacity = ON_orderring_Capacity_DESIRED	bed
Private_Funds(t)	Private_Funds(t − dt) + (Revenues − Spending − From_private_money − Personal_Expenses) × dt	INIT Private_Funds = Revenues/Avg_markup	EUR
Tot_cust(t)	Tot_cust(t − dt) + (change_in_tot_customer) × dt	INIT Tot_cust = STD_person_to_follow_high_quality_restaurants + Customers	people/year
change_in_tot_customer	(total_customers-Tot_cust)/1		people/(year-yr)
Construction_Rate	On_ordering_Capacity/AVG_Constriction_Time		bed/yr
From_Loan	GaP × Fraction_from_loan		EUR/yr
From_private_money	GaP × Fraction_to_invest_in_a_new_project		EUR/yr
New_loan	From_Loan		EUR/yr
Obasolescence_rate	Hospitality_Capacity/15		bed/yr
Obsolescnce_rate	Equipement_and_Store/AVG_lifetime		EUR/yr
Personal_Expenses	Desired_Personal_income		EUR/yr
Renovation	EQ_ADJ		EUR/yr
repayment_rate	Loan/15		EUR/yr
Revenues	Earnings_from_operation		EUR/yr
Spending	Renovation + Total_Costs + Interest_spending + repayment_rate + Fix_Costs + Networking_expenses		EUR/yr
Starting_costruction	MAX(TOTAL_Capacity_ADJ;0)		bed/yr

Actual_level_of_Equipment_and_Store	Equipement_and_Store/Initial_Equi_and_store_level		Unitless
Actual_person_follow_quality	IF(TRND_arrivals < 0) THEN(Effect_of_perfceived_quality_on_ST_person_to_follow_quality_rest × STD_person_to_follow_high_quality_restaurants) ELSE(Effect_of_perfceived_quality_on_ST_person_to_follow_quality_rest × STD_person_to_follow_high_quality_restaurants)		
AVG_Constriction_Time	3		year
AVG_lifetime	10		year
Avg_markup	2.4		Unitless
AVG_price	40		EUR/people
AVG_spending_per_customer	Total_Costs/Tot_cust		EUR/person
AVG_Unit_cost	AVG_price/Avg_markup		EUR/people
AVG_working_Days	280		per year
Benchmark	AVG_price/1.6		EUR/person
Capacity_equivalent	Hospitality_Capacity × AVG_working_Days		bed/yr
Capacity_GAP	Desired_Capacity-Hospitality_Capacity		bed
Cpèacity_ADJ	(Capacity_GAP/Time_to_correct) + Perceived_Obs_rate		bed/yr
Credit_Line	IF(Private_Funds < 0) THEN(Private_Funds × −1) ELSE(0)		EUR
Customers	Shared_Resources.arrivals × Probability_to_eat_in_a_Resaturants		person/yr
Desired_Capacity	Goal		bed
Desired_investment	50,000		EUR
Desired_Personal_income	30,000		EUR/year
Earnings_from_operation	total_customers × AVG_price		EUR/yr
Effect_of_perfceived_quality_on_ST_person_to_follow_quality_rest	GRAPH(perceived_quality) Points: (0.000, 0.500), (0.200, 0.561093247588), (0.400, 0.647909967846), (0.600, 0.747588424437), (0.800, 0.872990353698), (1.000, 1.02090032154), (1.200, 1.17202572347), (1.400, 1.31028938907), (1.600, 1.41961414791), (1.800, 1.48392282958), (2.000, 1.500)		Unitless
Effect_of_price_on_probability	GRAPH(SMTH1(Price_Ratio;1.5)) Points: (0.500, 1.3000), (0.650, 1.2459807074), (0.800, 1.18424437299), (0.950, 1.10964630225), (1.100, 0.996463022508), (1.250, 0.844694533762), (1.400, 0.741800643087), (1.550, 0.659485530547), (1.700, 0.579742765273), (1.850, 0.536012861736), (2.000, 0.512861736334)		Unitless
effetc_of_Long_termi_porjects_on_capacity	GRAPH(SMTH1(Municipality.Completed_Projects;2)) Points: (0.000, 1.0000), (2.000, 1.3536977492)		Unitless
EQ_ADJ	(Equipment_and_store_gap/Time_to_close_the_gap) + Obsolescnce_rate	REPORT IN TABLE AS FLOW	EUR/yr
Equipment_and_store_gap	(Private_desired_EQ_store_level × Initial_Equi_and_store_level)-Equipement_and_Store		EUR
Fix_Costs	(55,000 × (AVG_working_Days/160)) + (unit_fixed_per_cust × Customers)		EUR/year
Fraction_from_loan	1-Fraction_to_invest_in_a_new_project		per year
Fraction_to_invest_in_a_new_project	0.2		per year
GaP	New_investment_switch × (Desired_investment-Long_term_Investments)		EUR
Goal	200 × effetc_of_Long_termi_porjects_on_capacity × Long_term_Investement_ratio		bed
Gross_Profit_or_Losses	Revenues-Spending	REPORT IN TABLE AS FLOW	EUR/yr
Initial_Equi_and_store_level	150,000		EUR
Interest_rate	0.05		per year
Interest_spending	(Credit_Line + Loan) × Interest_rate		EUR/yr
Long_term_Investement_ratio	GRAPH(Long_term_Investments/Desired_investment) Points: (0.000, 1.000), (2.000, 1.500)		Unitless
Networking_expenses	500		EUR/year
New_investment_switch	1		
Obsolescence_ratio	MIN(1;Actual_level_of_Equipment_and_Store/obsolescence_treshold)		Unitless
obsolescence_treshold	0.85		
On_ordering_capacity_GAP	ON_orderring_Capacity_DESIRED-On_ordering_Capacity		bed
On_ordering_Correction	On_ordering_capacity_GAP/Time_to_Correct_capacity		bed/yr

ON_orderring_Capacity_DESIRED	Cpèacity_ADJ × AVG_Constriction_Time		bed
Perceived_Obs_rate	SMTH1(Obasolescence_rate;1.5)	REPORT IN TABLE AS FLOW	bed/yr
perceived_quality	SMTH1(Quality_index × Actual_level_of_Equipment_and_Store;1.5)		Unitless
Price_Ratio	AVG_price/Reference_price		person/people
Private_desired_EQ_store_level	1-reduce_the_mantenaince		Unitless
Probability_to_eat_in_a_Resaturants	0.45 × Shared_Resources.Effect_of_AVG_oer_tourists_spending_on_probability × Effect_of_price_on_probability		Unitless
Quality_index	GRAPH(AVG_spending_per_customer/Benchmark) Points: (0.000, 0.5000), (0.150, 0.516923076923), (0.300, 0.546153846154), (0.450, 0.601538461538), (0.600, 0.658461538462), (0.750, 0.755384615385), (0.900, 0.896923076923), (1.050, 0.975384615385), (1.200, 0.998461538462), (1.350, 1.0000), (1.500, 1.0000)		Unitless
reduce_the_mantenaince	0		Unitless
Reference_price	30		EUR/person
STD_person_to_follow_high_quality_restaurants	1000		people/year
Time_to_close_the_gap	1		year
Time_to_correct	2		year
Time_to_Correct_capacity	3		year
TOTAL_Capacity_ADJ	Cpèacity_ADJ + On_ordering_Correction		bed/yr
Total_Costs	AVG_Unit_cost × Tot_cust		EUR/yr
total_customers	Customers + Actual_person_follow_quality		person/yr
TRND_arrivals	TREND(Shared_Resources.arrivals;1)		per time
unit_fixed_per_cust	GRAPH(Customers) Points: (0, 1.000), (600, 1.000), (1200, 1.000), (1800, 1.000), (2400, 1.000), (3000, 1.24437299035), (3600, 1.81028938907), (4200, 2.18971061093), (4800, 2.67845659164), (5400, 2.89067524116), (6000, 3.000)		EUR/people
Municipality			
Variable Name	*Equations*	*Properties*	*Units*
Completed_Projects(t)	Completed_Projects(t − dt) + (Realizatio_rate) × dt	INIT Completed_Projects = 0	project
Cumulative_Payment_for_projects(t)	Cumulative_Payment_for_projects(t − dt) + (New_payment_to_perform − Payement_to_Businesses) × dt	INIT Cumulative_Payment_for_projects = To_build	EUR
Done(t)	Done(t − dt) + (Fisical_Construction_Rate) × dt	INIT Done = 0	EUR
Executive_projects(t)	Executive_projects(t − dt) + (Designing_Rate − Win_rate) × dt	INIT Executive_projects = 0	project
Loan(t)	Loan(t − dt) + (Change_in_loacn − Loan_Repayment_rate) × dt	INIT Loan = To_build × Fraction_to_Loan	EUR
Municipal_Funds(t)	Municipal_Funds(t − dt) + (Revenues − Spending) × dt	INIT Municipal_Funds = 9000000	EUR
N_of_Cultural_events(t)	N_of_Cultural_events(t − dt) + (Chnage_in_Events) × dt	INIT N_of_Cultural_events = Number_of_events	event
On_ordering_Service_Level(t)	On_ordering_Service_Level(t − dt) + (Planning_Service_Level − Implementation_Service_rate) × dt	INIT On_ordering_Service_Level = 0	people
ON_planning_stage(t)	ON_planning_stage(t − dt) + (Planning_rate − Designing_Rate) × dt	INIT ON_planning_stage = 0	project
PLanned_Project(t)	PLanned_Project(t − dt) + (Change_in_Project) × dt	INIT PLanned_Project = 0	project
Projects_Funds(t)	Projects_Funds(t − dt) + (Money_to_project − Flow_1) × dt	INIT Projects_Funds = 0	EUR
Resources_won(t)	Resources_won(t − dt) + (Money_from_Other_sources − Payment) × dt	INIT Resources_won = 0	EUR
Service_level(t)	Service_level(t − dt) + (Implementation_Service_rate − Service_reduction) × dt	INIT Service_level = Shared_Resources. Population + Shared_Resources. Presences	people
Surplus_or_debt(t)	Surplus_or_debt(t − dt) + (new_surplus + Debt_repayment − using_surplus − new_debt_1) × dt	INIT Surplus_or_debt = 0	EUR
To_be_realized(t)	To_be_realized(t − dt) + (Win_rate − Realizatio_rate) × dt	INIT To_be_realized = 0	project
To_build(t)	To_build(t − dt) + (new_financed_project − Fisical_Construction_Rate) × dt	INIT To_build = To_be_realized × AVG_Amount_in_EUR_per_Project_from_EU	EUR
Change_in_loacn	new_financed_project × Fraction_to_Loan		EUR/yr
Change_in_Project	(Decision_to_Start_a_project-PLanned_Project)/1		project/yr
Chnage_in_Events	events_adj		event/yr
Debt_repayment	IF(Surplus_or_debt < 0) THEN((Surplus_or_debt × −1)/5) ELSE(0)		EUR/yr

Designing_Rate	Flow_1/AVG_resources_per_Project		project/yr
Fisical_Construction_Rate	Payement_to_Businesses		EUR/yr
Flow_1	Projects_Funds/1		EUR/yr
Implementation_Service_rate	On_ordering_Service_Level/AVG_imolementation_Time		person/yr
Loan_Repayment_rate	Loan/AVG_time_to_repay_loan		EUR/yr
Money_from_Other_sources	new_financed_project × Fraction_from_EU		EUR/yr
Money_to_project	AVG_resources_per_Project × Planning_rate		EUR/yr
new_debt_1	IF(deficit_surplus_indicator < 0) THEN((deficit_surplus_indicator × −1)/1) ELSE(0)		EUR/yr
new_financed_project	Perceived_Win_rate × AVG_Amount_in_euro_per_Project_from_EU		EUR/yr
New_payment_to_perform	perceived_Flow_of_loan + Perceived_Flow_of_Resources_from_EU		EUR/yr
new_surplus	IF(deficit_surplus_indicator > 0) THEN(deficit_surplus_indicator/1) ELSE(0)		EUR/yr
Payement_to_Businesses	MAX_payment_available		EUR/yr
Payment	Payement_to_Businesses × Fraction_from_EU		EUR/yr
Planning_rate	ADJ_ofr_projects		project/yr
Planning_Service_Level	MAX(TOTAL_ADJ_1;0)		person/yr
Realizatio_rate	Fisical_Construction_Rate/AVG_Amount_in_euro_per_Project_from_EU		project/yr
Revenues	Total_Fixed_Revenues + Revenues_rom_Tourism		EUR/yr
Service_reduction	IF(Service_level > Municipality_Waste_Desired_Service_Level) THEN((Service_level-Municipality_Waste_Desired_Service_Level)/1) ELSE(0)		person/yr
Spending	Projects_Spending + Interest_Spending + General_Personnel_Administration_and_Social + Rimborso_Prestiti + Garbage_collection_to_pop_Expenses + Cultural_and_Tourism_Policies		EUR/yr
using_surplus	IF(Surplus_or_debt < 0) OR (Surplus_or_debt = 0) THEN(0) ELSE(Surplus_or_debt × Fraction_of_surplus_to_spend)		EUR/yr
Win_rate	Converter_1		project/yr
ACTUAL_spending_per_capita	General_Personnel_Administration_and_Social/Shared_Resources.Population		EUR/(person-yr)
ADJ_ofr_projects	(PLanned_Project-Tot_projects)/AT		project/yr
AT	1		year
AVG_Amount_in_euro_per_Project_from_EU	1,000,000		EUR/project
AVG_cost	GRAPH(Service_level) Points: (0, 100.00), (3000, 100.00), (6000, 100.00), (9000, 100.00), (12,000, 100.00), (15,000, 100.00), (18,000, 80.00), (21,000, 80.00), (24,000, 80.00), (27,000, 80.00), (30,000, 80.00)		EUR/(people-year)
AVG_exectution_Time	3		year
AVG_imolementation_Time	1		year
AVG_per_capita_from_STATE	GRAPH(TIME) Points: (0.00, 199.421221865), (1.00, 195.36977492), (2.00, 183.794212219), (3.00, 172.797427653), (4.00, 160.643086817), (5.00, 145.594855305), (6.00, 124.758842444), (7.00, 103.344051447), (8.00, 83.6655948553), (9.00, 61.0932475884), (10.00, 40.8360128617), (11.00, 29.8392282958), (12.00, 20.0)		EUR/(people-year)
AVG_resources_per_Project	50,000		EUR/project
AVG_revenues_per_Turist	400		EUR/people
AVG_Spending_per_Event	IF(N_of_Cultural_events = 0) THEN(0) ELSE(Spending_in_Tourism_and_Cultural_Events/N_of_Cultural_events)		EUR/(event-year)
AVG_Taxes_Per_citizens	400		EUR/(people-year)
AVG_time_to_repay_loan	10		year
Bechmark	6000		EUR/(event-year)
Contribution_per_events	10,000		EUR/(event-year)
Converter_1	PULSE(Probability_to_Win_a_call_For_tenders)		
Credit_line	IF(Municipal_Funds < Hist_value) THEN(Hist_value-Municipal_Funds) ELSE(0)		EUR
Cultural_and_Tourism_Policies	Public_spenging_in_Events + Resources_to_Museum + Networking_investment + Garbage_speding_to_Tourism		EUR/year

Decision_to_Start_a_project	2		project
deficit_surplus_indicator	Surplus_Deficit_Indicator		EUR/yr
Desired_Payment_rate	To_build/AVG_exectution_Time		EUR/yr
Effectiveness_of_Events	GRAPH(AVG_Spending_per_Event/Bechmark) Points: (1.000, 1.0000), (2.000, 1.5000)		Unitless
events_adj	(Number_of_events-N_of_Cultural_events)/1		
Events_Ratio	N_of_Cultural_events/Months_of_the_year		event/month per year
fractio_to_loan_repayment	0		per year
Fraction_from_EU	0.4		Unitless
Fraction_general_Administration_expenses	1-Fraction_to_cultural_and_tourism_policiies_garbage_and_loan-Fraction_to_social_expenses		per year
Fraction_of_Garbage_collection_ex_to_tourims	0		1/year
Fraction_of_surplus_to_spend	1		per year
Fraction_to_cultural_and_tourism_policiies_garbage_and_loan	(1/1) + Fraction_of_Garbage_collection_ex_to_tourims + fractio_to_loan_repayment + to_project_spendin		1/year
Fraction_to_Loan	0.6		Unitless
Fraction_to_social_expenses	0.09		per year
Garbage_collection_to_pop_Expenses	IF(Service_level > Shared_Resources.Population) THEN(Shared_Resources.Population × AVG_cost) ELSE(Service_level × AVG_cost)		EUR/year
Garbage_speding_to_Tourism	(Service_level × AVG_cost)-Garbage_collection_to_pop_Expenses		EUR/year
Gen_and_Cult	Fraction_general_Administration_expenses + Fraction_to_cultural_and_tourism_policiies_garbage_and_loan		per year
General_Personnel_Administration_and_Social	Revenues-Total_tourism_Policy_spending {included contributions + museum personnell}	REPORT IN TABLE AS FLOW	EUR/yr
Hist_value	HISTORY(Municipal_Funds;TIME-1)		EUR
INIT_Municipal_Funds	Revenues × obsr_time	REPORT IN TABLE AS FLOW	EUR
Interest_of_loan	Loan × INTEREST_RATE_FOR_LOAN		EUR/yr
INTEREST_RATE_FOR_LOAN	GRAPH(AVG_time_to_repay_loan) Points: (0.00, 0), (40.00, 0.01)		per year
Interest_Spending	IF(Surplus_or_debt < 0) THEN((Surplus_or_debt) × percentage_Interest) ELSE(0)		EUR/yr
Max_Available_payment	0		
MAX_payment_available	MAX(MIN(Desired_Payment_rate;(New_payment_to_perform-Debt_repayment + using_surplus));0)	REPORT IN TABLE AS FLOW	EUR/yr
Months_of_the_year	12		month per year
Municipality_Waste_Desired_Service_Level	30,000		people
Networking_investment	31,000		EUR/year
Number_of_events	10		events
obsr_time	1		year
On_ordering_Correction	On_ordering_GAP/Time_to_Correct_SL		person/yr
On_ordering_GAP	ON_orderring_SL_DESIRED-On_ordering_Service_Level		people
ON_orderring_SL_DESIRED	SL_ADJ × AVG_imolementation_Time		people
Perceived_Event_Ratio	SMTH1(Events_Ratio × Effectiveness_of_Events;1.5)		event/month per year
perceived_Flow_of_loan	SMTH1(Change_in_loacn;1)	REPORT IN TABLE AS FLOW	EUR/yr
Perceived_Flow_of_Resources_from_EU	SMTH1(Money_from_Other_sources;1)	REPORT IN TABLE AS FLOW	
Perceived_Win_rate	SMTH1(Win_rate;1)	REPORT IN TABLE AS FLOW	project/yr
percentage_Interest	0.05		per year
Probability	MIN(Tot_projects × 5;35)		project/yr
Probability_to_Win_a_call_For_tenders	MONTECARLO(Probability;20)		project/yr
Project_won	1		project/yr
Projects_Spending	Money_to_project	REPORT IN TABLE AS FLOW	EUR/yr
Public_spenging_in_Events	Spending_in_Tourism_and_Cultural_Events		EUR/year
Resources_to_Museum	0		EUR/year

Revenues_from_region	GRAPH(TIME) Points: (0.00, 2,000,000), (0.833333333333, 1,980,707.3955), (1.66666666667, 1,980,707.3955), (2.50, 1,967,845.65916), (3.33333333333, 1,954,983.92283), (4.16666666667, 1,935,691.31833), (5.00, 1,935,691.31833), (5.83333333333, 1,954,983.92283), (6.66666666667, 1,974,276.52733), (7.50, 1,942,122.1865), (8.33333333333, 1,942,122.1865), (9.16666666667, 1,974,276.52733), (10.00, 1,961,414.791)		
Revenues_from_state	Shared_Resources.Population × AVG_per_capita_from_STATE		EUR/year
Revenues_rom_Tourism	Shared_Resources.arrivals × AVG_revenues_per_Turist		EUR/year
Rimborso_Prestiti	Interest_of_loan + Loan_Repayment_rate + Debt_repayment	REPORT IN TABLE AS FLOW	EUR/yr
Service_Adequancy	MIN(Service_level/(Shared_Resources.Presences + Shared_Resources.Population);1)		Unitless
SL_ADJ	SL_GAP/Time_to_implement_service_level		person/yr
SL_GAP	Municipality_Waste_Desired_Service_Level-Service_level		people
Spending_in_Tourism_and_Cultural_Events	N_of_Cultural_events × Contribution_per_events		EUR/year
Surplus_Deficit_Indicator	Revenues-Spending	REPORT IN TABLE AS FLOW	EUR/yr
taxation_over_citizens	Shared_Resources.Population × AVG_Taxes_Per_citizens		EUR/year
Time_to_Correct_SL	1		year
Time_to_implement_service_level	1		year
to_project_spendin	0		per year
Tot_projects	Executive_projects + ON_planning_stage		project
TOTAL_ADJ_1	SL_ADJ + On_ordering_Correction		person/yr
Total_Fixed_Revenues	taxation_over_citizens + Revenues_from_state + Revenues_from_region		EUR/year
Total_Fraction	Gen_and_Cult + Fraction_to_social_expenses		
total_spending	Garbage_collection_to_pop_Expenses + Rimborso_Prestiti + General_Personnel_Administration_and_Social + Cultural_and_Tourism_Policies		EUR/yr
Total_tourism_Policy_spending	Rimborso_Prestiti + Cultural_and_Tourism_Policies + Garbage_collection_to_pop_Expenses		EUR/yr
Museum			
Variable Name	*Equations*	*Properties*	*Units*
Articles(t)	Articles(t − dt) + (New_Pubblications) × dt	INIT Articles = Cumulative_Events × STD_PUB_PER_EVENT	pub
Completed_Projects(t)	Completed_Projects(t − dt) + (Completition_Rate) × dt	INIT Completed_Projects = 0	project
Concerts(t)	Concerts(t − dt) + (Chnage_in_COncerts_1) × dt	INIT Concerts = Number_of_Concerts	event
Cumulative_Events(t)	Cumulative_Events(t − dt) + (Flow_4) × dt	INIT Cumulative_Events = Exibition + Concerts	event
Exibition(t)	Exibition(t − dt) + (Chnage_in_Events) × dt	INIT Exibition = Number_of_Exibition_performances_or_pubblications	event
Museum_Funds(t)	Museum_Funds(t − dt) + (Revenues − Spending) × dt	INIT Museum_Funds = Revenues×Observ_time	EUR
On_Working_stage(t)	On_Working_stage(t − dt) + (Planning_rate − Completition_Rate) × dt	INIT On_Working_stage = 0	project
PLanned_Project(t)	PLanned_Project(t − dt) + (Change_in_Project) × dt	INIT PLanned_Project = Decision_to_Start_a_project_with_school	project
Revenues_value(t)	Revenues_value(t − dt) + (Change_in_prev_value) × dt	INIT Revenues_value = Revenues × Observ_time	EUR
Spending_value(t)	Spending_value(t − dt) + (Flow_1) × dt	INIT Spending_value = Spending × Observ_time	EUR
Surplus_or_debt(t)	Surplus_or_debt(t − dt) + (new_surplus − using_surplus − new_debt) × dt	INIT Surplus_or_debt = 0	EUR
Change_in_prev_value	GAP/Time_to_perceive		EUR/yr
Change_in_Project	(Decision_to_Start_a_project_with_school-PLanned_Project)/1		project/yr
Chnage_in_COncerts_1	Conceerts_adj_1		event/yr
Chnage_in_Events	Axibition_ADJ		event/yr
Completition_Rate	On_Working_stage/1		project/yr
Flow_1	Converter_1/Time_to_perceive		EUR/yr
Flow_4	(Exibition + Concerts)/Obsrv_time		event/yr
new_debt	IF(deficit_surplus_indicator < 0) THEN((deficit_surplus_indicator × −1)/1) ELSE(0)		EUR/yr
New_Pubblications	((Exibition × STD_PUB_PER_EVENT + STD_PUB_PER_EVENT*Concerts)*TOTAL_Multiplier)/obs_time		pub/yr

new_surplus	IF(deficit_surplus_indicator > 0) THEN(deficit_surplus_indicator/1) ELSE(0)		EUR/yr
Planning_rate	PLanned_Project/1		project/yr
Revenues	Revenues_from_Ticket_sold + revenues_from_Municipality + using_surplus		EUR/yr
Spending	Spending_in_Exibition + Administrative_And_General_Costs + Concert_Spending + Education_Spending + Networking_expenses		EUR/yr
using_surplus	IF(Surplus_or_debt < 0) OR (Surplus_or_debt = 0) THEN(0) ELSE(Surplus_or_debt × Fraction_of_surplus_to_spend)		EUR/yr
Administrative_And_General_Costs	32,000		EUR/year
AVG_contribution_per_project	2000		EUR/project
AVG_pub_per_event	Articles/Cumulative_Events		pub/event
AVG_Spending_per_CONCEERT_1	IF(Concerts = 0) THEN(0) ELSE(Spendig_in_concerts/Concerts)		EUR/(event-year)
AVG_Spending_per_Event	IF(Exibition = 0) THEN(0) ELSE(Spending_in_exibitions/Exibition)		EUR/(event-year)
Axibition_ADJ	(Number_of_Exibition_performances_or_pubblications-Exibition)/0.25		
Conceerts_adj_1	(Number_of_Concerts-Concerts)/0.25		
Concert_Intensiveness	(Concerts × MIN(Effectiveness_of_Events_1;1))/Months_of_the_year_1		event/month per year
Concert_Spending	Spendig_in_concerts-spending_coverage_from_private		EUR/year
Contribute_per_Concerts	3000		EUR/(event-year)
Contribution_per_exibition	5000		EUR/(event-year)
Converter_1	((Spending × Observ_time)-Spending_value)	REPORT IN TABLE AS FLOW	EUR
Converter_6	Surplus_or_debt		EUR
Decision_to_Start_a_project_with_school	2		project
deficit_surplus_indicator	Revenues_value-Spending_value		EUR
Differentiation_Ratio	GRAPH(Exibition/Concerts) Points: (0.000, 0.000), (0.200, 0.250803858521), (0.400, 0.51768488746), (0.600, 0.742765273312), (0.800, 1.000), (1.000, 1.000), (1.200, 1.000), (1.400, 1.000), (1.600, 0.652733118971), (1.800, 0.353697749196), (2.000, 0.000)		Unitless
Education_Spending	Completition_Rate × AVG_contribution_per_project	REPORT IN TABLE AS FLOW	EUR/yr
effect_of_events_frequency_on_visits	GRAPH(Perceived_frequency_of_events_per_month/threshold) Points: (0.500, 0.5000), (0.650, 0.77459807074), (0.800, 0.871382636656), (0.950, 0.918649517685), (1.100, 1.01189710611), (1.250, 1.09196141479), (1.400, 1.13183279743), (1.550, 1.15948553055), (1.700, 1.17942122186), (1.850, 1.1884244373), (2.000, 1.18713826367)		Unitless
Effectiveness_of_Events_1	GRAPH(AVG_Spending_per_CONCEERT_1/Reference_AVG_spending_per_Concerts) Points: (0.000, 0.500), (1.000, 1.00160771704), (2.000, 2.000)		Unitless
Exibition_Intensiveness	(Exibition × MIN(Exibition_spending_multiplier;1))/Months_of_the_year		event/month per year
Exibition_spending_multiplier	GRAPH(AVG_Spending_per_Event/Reference_AVG_spending_per_EXIBITION_1) Points: (0.000, 0.500), (1.000, 1.00160771704), (2.000, 2.000)		Unitless
Financial_Authonomy	(Revenues_from_Ticket_sold + using_surplus)/Revenues	REPORT IN TABLE AS FLOW	Unitless
Fraction_of_surplus_to_spend	1		per year
GAP	((Revenues × Observ_time)-Revenues_value)	REPORT IN TABLE AS FLOW	EUR
Historical_Revenues	HISTORY(Revenues_value;TIME-1)		EUR
init_value_of_museum_funds	60,000		EUR
Months_of_the_year	12		month per year
Months_of_the_year_1	12		month per year
Networking_expenses	4800		EUR/year
Number_of_Concerts	7		events
Number_of_Exibition_performances_or_pubblications	7		events
obs_time	1		year
Observ_time	1		year

Obsrv_time	1		year
One_day_Visitors	15,000 × ratio		people/year
perceived	SMTH1(Shared_Resources.arrivals;1)		
Perceived_Event_Ratio	SMTH1(Exibition_Intensiveness;1.5)		Unitless
Perceived_Event_Ratio_1	SMTH1(Concert_Intensiveness;1.5)		Unitless
Perceived_frequency_of_events_per_month	SMTH1(Exibition_Intensiveness + Concert_Intensiveness;1.5)		event/month per year
Price	2.5		EUR/people
probability_to_visit	0.7 × Shared_Resources.Effect_of_AVG_oer_tourists_spending_on_probability		Unitless
Professionality_Indicator	IF(Financial_Authonomy > 0.7) AND(pub_coverage_ratio > 0.99) AND(Converter_6 > 0) THEN(1) ELSE(0.5)		Unitless
pub_coverage_ratio	AVG_pub_per_event/STD_PUB_PER_EVENT		Unitless
ratio	GRAPH(Municipality.Perceived_Event_Ratio/threshold) Points: (0.000, 0.411575562701), (0.200, 0.469453376206), (0.400, 0.565916398714), (0.600, 0.739549839228), (0.800, 0.945337620579), (1.000, 1.05466237942), (1.200, 1.09324758842), (1.400, 1.11254019293), (1.600, 1.12540192926), (1.800, 1.13183279743), (2.000, 1.13826366559)		Unitless
Reference_AVG_spending_per_Concerts	300		EUR/(event-year)
Reference_AVG_spending_per_EXIBITION_1	3500		EUR/(event-year)
Resources_from_external_parties	Contribute_per_Concerts × Professionality_Indicator × STD_fraction_of_external_contribution		EUR/(event-year)
Resources_from_external_parties_per_exibition	Professionality_Indicator × STD_fraction_of_external_contribution × Contribution_per_exibition		EUR/(event-year)
revenues_from_Municipality	Municipality.Resources_to_Museum		EUR/year
Revenues_from_Ticket_sold	Ticket_Sold × Price		EUR/year
Spendig_in_concerts	(Concerts × Contribute_per_Concerts)		EUR/year
spending_coverage_from_private	Concerts × Resources_from_external_parties		EUR/year
Spending_coverage_from_private_to_all_exibition	Exibition × Resources_from_external_parties_per_exibition		EUR/year
Spending_in_Exibition	Spending_in_exibitions-Spending_coverage_from_private_to_all_exibition		EUR/year
Spending_in_exibitions	(Exibition × Contribution_per_exibition)		EUR/year
STD_fraction_of_external_contribution	0.25		Unitless
STD_PUB_PER_EVENT	2		pub/event
threshold	1		event/month per year
Ticket_Sold	(perceived × probability_to_visit) + visits_due_to_the_events + One_day_Visitors		people/year
Time_to_perceive	0.5		year
Tot_projects	Completed_Projects + On_Working_stage		project
TOTAL_Multiplier	Exibition_spending_multiplier + Effectiveness_of_Events_1		Unitless
total_resources_from_private	Spending_coverage_from_private_to_all_exibition + spending_coverage_from_private		EUR/year
visits_due_to_the_events	10,000 × effect_of_events_frequency_on_visits		people/year
Shared Resources			
Variable Name	*Equations*	*Properties*	*Units*
Businesses(t)	Businesses(t − dt) + (Change_in_Businesses) × dt	INIT Businesses = INIT_number_of_Businesses	units
Labour(t)	Labour(t − dt) + (Hiring_Rate − Quit_rate) × dt	INIT Labour = Businesses×AVG_Workers_per_Business	people
Local_area_Image(t)	Local_area_Image(t − dt) + (Change_in_Image) × dt	INIT Local_area_Image = Indicated_Image	Unitless
Population(t)	Population(t − dt) + (Birtn_rate + In_Migration − Death_rate − Out_Migraton) × dt	INIT Population = 9090	people
Potential(t)	Potential(t − dt) + (New_tourists_potential − arrivals − Flow_1) × dt	INIT Potential = 10000	people
Potential_Room_Occupancy(t)	Potential_Room_Occupancy(t − dt) + (Change_in_bed) × dt	INIT Potential_Room_Occupancy = Potential × Avg_residence_time	bed/year

Presences(t)	Presences(t − dt) + (arrivals − Leaving_rate) × dt	INIT Presences = Potential × 1.8	people
Serv_Quality(t)	Serv_Quality(t − dt) + (Change_in_Service_Quality) × dt	INIT Serv_Quality = Srv_Quot_indx	Unitless
Vacancies(t)	Vacancies(t − dt) + (Opening_Rate − Clsing_rate) × dt	INIT Vacancies = Desired_Vacancies	people
arrivals	Room_Capacity_Utilization×person_per_bed × Business_Sector.Capacity_equivalent		person/yr
Birtn_rate	Population × Avg_Birth_rate		person/yr
Change_in_bed	(Potential × Avg_residence_time-Potential_Room_Occupancy)/1		bed/(year-yr)
Change_in_Businesses	Local_Value_TREND × (Businesses × Weight_of_tourism_on_main_econmy)		unit/yr
Change_in_Image	(Indicated_Image-Local_area_Image)/Perception_Time		per year
Change_in_Service_Quality	(Srv_Quot_indx-Serv_Quality)/2		per year
Clsing_rate	Hiring_Rate		person/yr
Death_rate	Population × Avg_death_rate		person/yr
Flow_1	Potential × effect_of_service_quality_on_reduction_rate		person/yr
Hiring_Rate	Vacancies/Time_to_hire		person/yr
In_Migration	Fraction_in_mig_rate × Population		Unitless
Leaving_rate	Presences/Min_Holiday_lenght		person/yr
New_tourists_potential	Ini_number_of_tourists × Effect_of_Local_Area_Image_on_New_Tourists		person/yr
Opening_Rate	Desired_Vacancies_Creation_Rate		person/yr
Out_Migraton	Population × Fraction_Out_Mig		person/yr
Quit_rate	Labour × AVG_Duartion_time		person/yr
ADJ_for_labour	(Desired_Labour-Labour)/Time_to_adjust_labour		person/yr
ADJ_for_Vacancies	(Desired_Vacancies-Vacancies)/Time_t_oadjust_vacancies		person/yr
arrivals_1	SMTH1(arrivals;2)	REPORT IN TABLE AS FLOW	person/yr
Avg_Birth_rate	0.01		per year
Avg_death_rate	0.01		per year
AVG_Duartion_time	0.01		per year
AVG_holiday_lenght	Presences/Leaving_rate	REPORT IN TABLE AS FLOW	years
AVG_per_tourist_spending	Total_Networking_expenses/arrivals	REPORT IN TABLE AS FLOW	EUR-yr/(person-year)
Avg_residence_time	2.4		bed/(person-year)
AVG_Workers_per_Business	3		people/unit
Desired_Hiring_Rate	ADJ_for_labour + Expected_Quittig_rate		person/yr
Desired_Labour	Businesses × AVG_Workers_per_Business		people
Desired_Vacancies	Desired_Hiring_Rate × Time_to_hire		people
Desired_Vacancies_Creation_Rate	ADJ_for_Vacancies + Desired_Hiring_Rate		person/yr
Effect_of_AVG_oer_tourists_spending_on_probability	GRAPH(AVG_per_tourist_spending/Reference_Spending) Points: (0.000, 0.500), (0.200, 0.561093247588), (0.400, 0.647909967846), (0.600, 0.747588424437), (0.800, 0.872990353698), (1.000, 1.02090032154), (1.200, 1.17202572347), (1.400, 1.31028938907), (1.600, 1.41961414791), (1.800, 1.48392282958), (2.000, 1.500)		
effect_of_Local_area_image_on_min_holiday_lenght	GRAPH(Local_area_Image) Points: (0.6500, 0.7000), (0.6850, 0.769453376206), (0.7200, 0.842765273312), (0.7550, 0.902572347267), (0.7900, 0.979742765273), (0.8250, 1.04340836013), (0.8600, 1.11479099678), (0.8950, 1.19389067524), (0.9300, 1.24790996785), (0.9650, 1.27877813505), (1.0000, 1.28649517685)		Unitless
Effect_of_Local_Area_Image_on_New_Tourists	GRAPH(Local_area_Image) Points: (0.000, 0.300), (0.100, 0.384887459807), (0.200, 0.53536977492), (0.300, 0.697427652733), (0.400, 0.882636655949), (0.500, 1.04469453376), (0.600, 1.24919614148), (0.700, 1.38424437299), (0.800, 1.461414791), (0.900, 1.500), (1.000, 1.500)		Unitless
effect_of_service_quality_on_reduction_rate	GRAPH(perceived_service_quality) Points: (0.000, 1.000), (0.100, 0.96463022508), (0.200, 0.893890675241), (0.300, 0.829581993569), (0.400, 0.749196141479), (0.500, 0.668810289389), (0.600, 0.56270096463), (0.700, 0.440514469453), (0.800, 0.289389067524), (0.900, 0.141479099678), (1.000, 0.000)		Unitless

Expected_Quittig_rate	SMTH1(Quit_rate;1)	REPORT IN TABLE AS FLOW	
Fraction_in_mig_rate	GRAPH(Ratio_Pop_Workforce_needed) Points: (1.000, 0), (2.000, 0.01)		per year
Fraction_Out_Mig	GRAPH(Ratio_Pop_Workforce_needed) Points: (0.000, 0.01), (1.000, 0)		per year
Indicated_Image	MIN(Business_Sector.perceived_quality × Museum.Differentiation_Ratio×Municipality.Perceived_Event_Ratio;1)		Unitless
Ini_number_of_tourists	10,000		people/year
INIT_number_of_Businesses	450		units
Local_Value_TREND	TREND(arrivals_1;1)		per year
Loosin_services	GRAPH(TIME) Points: (0.00, 0.0102893890675), (0.833333333333, 0.0102893890675), (1.66666666667, 0.0257234726688), (2.50, 0.0540192926045), (3.33333333333, 0.087459807074), (4.16666666667, 0.128617363344), (5.00, 0.226366559486), (5.83333333333, 0.36270096463), (6.66666666667, 0.535048231511), (7.50, 0.689389067524), (8.33333333333, 0.766559485531), (9.16666666667, 0.8000), (10.00, 0.8000)		
Min_Holiday_lenght	2 × effect_of_Local_area_image_on_min_holiday_lenght		year
perceived_service_quality	SMTH3(Serv_Quality;5;1)		Unitless
Percentage_growth_rate	PERCENT(TREND_of_arrivals)		Unitless
Perception_Time	2.5		year
person_per_bed	1		person/bed
Ratio_Pop_Workforce_needed	(Vacancies/(Population × 0.42-Labour))/Reference_Vacancies_over_pop		Unitless
Ratio_Social_Spending_per_capita	Municipality.ACTUAL_spending_per_capita/Reference_Social_spending_per_capita		Unitless
Reference_Social_spending_per_capita	1000		EUR/(person-yr)
Reference_Spending	4		EUR/people
Reference_Vacancies_over_pop	0.02		Unitless
Room_Capacity_Saturation	Potential_Room_Occupancy/Business_Sector.Capacity_equivalent		yr/year
Room_Capacity_Utilization	GRAPH(Room_Capacity_Saturation) Points: (0.000, 0.000), (0.555555555556, 0.167202572347), (1.11111111111, 0.305466237942), (1.66666666667, 0.472668810289), (2.22222222222, 0.620578778135), (2.77777777778, 0.778135048232), (3.33333333333, 0.893890675241), (3.88888888889, 0.977491961415), (4.44444444444, 1.000), (5.000, 1.000)		Unitless
Srv_Quot_indx	Municipality.Service_Adequancy × Business_Sector.Obsolescence_ratio × Ratio_Social_Spending_per_capita		Unitless
Time_t_oadjust_vacancies	1		year
Time_to_adjust_labour	1		year
Time_to_hire	0.6		year
Total_Networking_expenses	Municipality.Networking_investment + Museum.Networking_expenses + (Business_Sector.Networking_expenses × 20)		EUR/year
TREND_of_arrivals	TREND(arrivals;1)	REPORT IN TABLE AS FLOW	per time
Weight_of_tourism_on_main_econmy	0.3		Unitless
Zero	0		

Run Specs:	
Start Time	0
Stop Time	12
DT	0.025
Fractional DT	False
Save Interval	0.025
Sim Duration	12
Time Units	Years
Pause Interval	3
Integration Method	Euler
Keep All Variable Results	True
Run By	Run
Calculate Loop Dominance Information	False

Notes

1 iThink and STELLA (short for Systems Thinking, Experimental Learning Laboratory with Animation, also marketed as iThink) are visual programming languages for system dynamics modeling introduced by Barry Richmond in 1985. The program, distributed by iseesystems®, allows users to run models created as graphical representations of a system using three fundamental building blocks: stocks, flows, and converters. iThink is used in academia as a teaching tool and is adopted for a variety of research and consultancy purposes.

2 It is a script for developing structured group model-building sessions [103].

3 The figure depicts outcomes also in the upper section of the DPM insight model, which shows strategic resources. They are modeled (by using a "chessboard" symbol) as co-flows of the corresponding variables in the "end results" section. Also, they are modeled as grey-filled boxes to distinguish "common goods" from other strategic resources.

References

1. Rocha, H.; Kunc, M.; Audretsch, D.B. Clusters, economic performance, and social cohesion: A system dynamics approach. *Reg. Stud.* **2020**, *54*, 1098–1111. [CrossRef]
2. Bianchi, C. Enhancing policy design and sustainable community outcomes through collaborative platforms based on a dynamic performance management and governance approach. In *Handbook of Policy Design*; Peters, G., Fontaine, G., Eds.; Edward Elgar: Cheltenham, UK, 2022; pp. 411–433.
3. Cepiku, D. Performance Management in Public Administrations. In *The Routledge Handbook of Global Public Policy and Administration*; Klassen, T., Cepiku, D., Lah, T.J., Eds.; Routledge: London, UK, 2017.
4. Fryer, K.; Antony, J.; Ogden, S. Performance management in the public sector. *Int. J. Public Sect. Manag.* **2009**, *22*, 478–498. [CrossRef]
5. Rajala, T.; Laihonen, H.; Vakkuri, J. Exploring challenges of boundary-crossing performance dialogues in hybrids. *J. Manag. Gov.* **2020**, *24*, 799–820. [CrossRef]
6. Talbot, C. Performance Management. In *The Oxford Handbook of Public Management*; Ferlie, E., Lynn, L.E., Pollitt, C., Eds.; Oxford University Press: Oxford, UK, 2005. [CrossRef]
7. Vignieri, V. Active community for climate change: A Dynamic Performance Governance analysis of a biodiversity preservation program. *Sustain. Account. Manag. Policy J.* **2023**. [CrossRef]
8. Cronin, M.A.; Gonzalez, C.; Sterman, J. Why don't well-educated adults understand accumulation? A challenge to researchers, educators, and citizens. *Organ. Behav. Hum. Decis. Process.* **2009**, *108*, 116–130. [CrossRef]
9. Korzilius, H.; Raaijmakers, S.; Rouwette, E.; Vennix, J. Thinking Aloud While Solving a Stock-Flow Task: Surfacing the Correlation Heuristic and Other Reasoning Patterns. *Syst. Res. Behav. Sci.* **2014**, *31*, 268–279. [CrossRef]
10. Moxnes, E. Misperceptions of basic dynamics: The case of renewable resource management. *Syst. Dyn. Rev.* **2004**, *20*, 139–162. [CrossRef]
11. Cavenago, D.; Trivellato, B. Organising strategic spatial planning: Experiences from Italian cities. *Space Polity* **2010**, *14*, 167–188. [CrossRef]
12. Dredge, D. Policy networks and the local organisation of tourism. *Tour. Manag.* **2006**, *27*, 269–280. [CrossRef]
13. Porter, M.E. The competitive advantage of the inner city. In *The City Reader*; Routledge: London, UK, 2011; pp. 282–295.
14. Banfield, E.C. *Moral Basis of a Backward Society*; Free Press: New York, NY, USA, 1967.
15. Kale, P.; Singh, H.; Perlmutter, H. Learning and protection of proprietary assets in strategic alliances: Building relational capital. *Strateg. Manag. J.* **2000**, *21*, 217–237. [CrossRef]
16. Vignieri, V. *Enhancing Performance Regimes to Enable Outcome-Based Policy Analysis in Cross-Boundary Settings*; Springer International Publishing: New York, NY, USA, 2022; Volume 6. [CrossRef]

17. Dekker, H.C. Control of inter-organizational relationships: Evidence on appropriation concerns and coordination requirements. *Account. Organ. Soc.* **2004**, *29*, 27–49. [CrossRef]
18. Ouchi, W.G. A Conceptual Framework for the Design of Organizational Control Mechanisms. *Manag. Sci.* **1979**, *25*, 833–848. [CrossRef]
19. Lim, S.; Berry, F.S.; Lee, K.H. Stakeholders in the Same Bed with Different Dreams: Semantic Network Analysis of Issue Interpretation in Risk Policy Related to Mad Cow Disease. *J. Public Adm. Res. Theory* **2016**, *26*, 79–93. [CrossRef]
20. Bianchi, C.; Vignieri, V. Dealing with "abnormal" business growth by leveraging local area common goods: An outside-in stakeholder collaboration perspective. *Int. J. Product. Perform. Manag.* **2020**, *70*, 613–634. [CrossRef]
21. Vignieri, V.; Bianchi, C. Designing Outcome-oriented Performance Regimes to enhance societal transition for inner area regeneration. Paper presented at Public Administration Review Virtual Boutique Symposium on "Harnessing the Evolutionary Advantage of Emergent PM Regimes: Strengthening Accountability for Challenges of Modern Public Administration and Governance". 2022.
22. Bouckaert, G.; Halligan, J. *Managing Performance: International Comparisons*; Routledge: London, UK, 2008.
23. Van Dooren, W.; Bouckaert, G.; Halligan, J. *Performance Management in the Public Sector*; Routledge: New York, NY, USA, 2015. [CrossRef]
24. Bianchi, C. *Dynamic Performance Management*; Springer International Publishing: New York, NY, USA, 2016; Volume 1, Issue 1. [CrossRef]
25. Bianchi, C.; Rivenbark, W.C. Performance Management in Local Government: The Application of System Dynamics to Promote Data Use. *Int. J. Public Adm.* **2014**, *37*, 945–954. [CrossRef]
26. Bianchi, C.; Tomaselli, S. A dynamic performance management approach to support local strategic planning. *Int. Rev. Public Admin.* **2015**, *20*, 370–385. [CrossRef]
27. Cosenz, F.; Noto, L. Combining system dynamics modelling and management control systems to support strategic learning processes in SMEs: A Dynamic Performance Management approach. *J. Manag. Control* **2015**, *26*, 225–248. [CrossRef]
28. Noto, G. *Strategic Planning for Urban Transportation: A Dynamic Performance Management Approach*; Springer International Publishing: New York, NY, USA, 2020; Volume 3. [CrossRef]
29. Vignieri, V. Framing the Sources of Image of a Local Area through Outcome-Based Dynamic Performance Management. *Public Organ. Rev.* **2019**, *19*, 249–271. [CrossRef]
30. Callon, M. Performativity, misfires and politics. *J. Cult. Econ.* **2010**, *3*, 163–169. [CrossRef]
31. Barnabè, F.; Busco, C. The causal relationships between performance drivers and outcomes. *J. Account. Organ. Chang.* **2012**, *8*, 528–538. [CrossRef]
32. Vosselman, E. The 'performativity thesis' and its critics: Towards a relational ontology of management accounting. *Account. Bus. Res.* **2014**, *44*, 181–203. [CrossRef]
33. Busco, C.; Quattrone, P. Performing business and social innovation through accounting inscriptions: An introduction. *Account. Organ. Soc.* **2018**, *67*, 15–19. [CrossRef]
34. Busco, C.; Quattrone, P. In Search of the "Perfect One": How accounting as a maieutic machine sustains inventions through generative ' in -tensions. *Manag. Account. Res.* **2018**, *39*, 1–16. [CrossRef]
35. Ammons, D.N.; Rivenbark, W.C. Factors influencing the use of performance data to improve municipal services: Evidence from the North Carolina benchmarking project. *Public Adm. Rev.* **2008**, *68*, 304–318. [CrossRef]
36. Moynihan, D. Advocacy and Learning: An Interactive-Dialogue Approach to Performance Information Use. In *Performance Information in the Public Sector*; Van Dooren, W., Van de Walle, S., Eds.; Palgrave Macmillan: London, UK, 2008.
37. Kroll, A. Drivers of performance information use: Systematic literature review and directions for future research. *Public Perform. Manag. Rev.* **2015**, *38*, 459–486. [CrossRef]
38. Moynihan, D.; Lavertu, S. Does Involvement in Performance Management Routines Encourage Performance Information Use? Evaluating GPRA and PART. *Public Adm. Rev.* **2012**, *72*, 592–602. [CrossRef]
39. Van de Walle, S.; van Dooren, W. How is Information Used to Improve Performance in the Public Sector? Exploring the Dynamics of Performance Information. In *Connecting Knowledge and Performance in Public Services: From Knowing to Doing*; Walshe, K., Harvey, G., Jas, P., Eds.; Cambridge University Press: Cambridge, UK, 2009; pp. 1–26. Available online: https://core.ac.uk/reader/18517941 (accessed on 2 January 2024).
40. Lane, D.C. Modelling as learning: A consultancy methodology for enhancing learning in management teams. *Eur. J. Oper. Res.* **1992**, *59*, 64–84. [CrossRef]
41. Lane, D.C. What Is a 'Policy Insight'? *Syst. Res. Behav. Sci.* **2012**, *29*, 590–595. [CrossRef]
42. Berg, B.L. *Qualitative Research Methods for the Social Sciences*, 4th ed.; Allyn and Bacon: Boston, MA, USA, 2001.
43. Gerlak, A.K.; Heikkila, T. Building a theory of learning in collaboratives: Evidence from the Everglades restoration program. *J. Public Adm. Res. Theory* **2011**, *21*, 619–644. [CrossRef]
44. Laihonen, H.; Mäntylä, S. Principles of performance dialogue in public administration. *Int. J. Public Sect. Manag.* **2017**, *30*, 414–428. [CrossRef]
45. Rajala, T.; Laihonen, H. Fragmentation and performance dialogues in public management. *Int. J. Public Sector Manag.* **2022**. *ahead-of-print*. [CrossRef]

46. Vignieri, V. Destination Governance at Stake: Fostering Policy Coordination Among Decision-Makers of a Small Town. *Tour. Plan. Dev.* **2019**, *16*, 556–574. [CrossRef]
47. Behn, R. The big questions of public management. *Public Adm. Rev.* **1995**, *55*, 313–324. [CrossRef]
48. Bouckaert, G. The History of the Productivity Movement. *Public Product. Manag. Rev.* **1990**, *14*, 53. [CrossRef]
49. Bouckaert, G. Measurement and Meaningful Management. *Public Product. Manag. Rev.* **1993**, *17*, 31. [CrossRef]
50. Moore, M.H. *Creating Public Value: Strategic Management in Government*; Harvard University Press: Cambridge, MA, USA, 1995.
51. Bovaird, T. The Political Economy of Performance Measurement. In *Organizational Performance and Measurement in the Public Sector: Toward Service, Efforts and Accomplishment Reporting*; Halachmi, A., Bouckaert, G., Eds.; Quorum Books: Westport, CT, USA, 1996; pp. 145–165.
52. Emerson, K.; Nabatchi, T. *Collaborative Governance Regimes*; Georgetown University Press: Washington, DC, USA, 2015.
53. Moynihan, D. *The Dynamics of Performance Management*; Georgetown University Press: Washington, DC, USA, 2008.
54. Rajala, T.; Laihonen, H. Managerial choices in orchestrating dialogic performance management. *Balt. J. Manag.* **2019**, *14*, 141–157. [CrossRef]
55. Revellino, S.; Mouritsen, J. Accounting as an engine: The performativity of calculative practices and the dynamics of innovation. *Manag. Account. Res.* **2015**, *28*, 31–49. [CrossRef]
56. Amernic, J.; Craig, R. Understanding accounting through conceptual metaphor: Accounting is an instrument? *Crit. Perspect. Account.* **2009**, *20*, 875–883. [CrossRef]
57. MacKenzie, D. *An Engine, Not a Camera: How Financial Models Shape Markets*; MIT Press: Cambridge, MA, USA, 2008.
58. Sterman, J. *Business Dynamics: Systems Thinking and Modeling for a Complex World*; Irwin/McGraw-Hill: New York, NY, USA, 2000.
59. Weick, K.E. *Sensemaking in Organizations*; Sage: Thousand Oaks, CA, USA, 1995.
60. Kleinmuntz, D.N. Cognitive Heuristics and Feedback in a Dynamic Decision Environment. *Manag. Sci.* **1985**, *31*, 680–702. [CrossRef]
61. Forrester, J.W. *Industrial Dynamics*; MIT Press: Cambridge, MA, USA, 1980.
62. Simon, H.A. *Administrative Behavior: A Study of Decision-Making Process in Administrative Organization*, 1st ed.; Macmillian: New York, NY, USA, 1947.
63. Sterman, J. Learning in and about complex systems. *Syst. Dyn. Rev.* **1994**, *10*, 291–330. [CrossRef]
64. Mohring, H. Maximizing, measuring, and not double counting transportation-improvement benefits: A primer on closed- and open-economy cost-benefit analysis. *Transp. Res. Part B Methodol.* **1993**, *27*, 413–424. [CrossRef]
65. Thissen, W.; Walker, W.E. *Public Policy Analysis*; Thissen, W., Walker, W.E., Eds.; Springer: New York, NY, USA, 2013; Volume 179. [CrossRef]
66. Prest, A.R.; Turvey, R. Cost-Benefit Analysis: A Survey. *Econ. J.* **1965**, *75*, 683–735. [CrossRef]
67. Bell, S.; Morse, S. *Measuring Sustainability: Learning From Doing*; Taylor & Francis: New York, NY, USA, 2013.
68. Innes, J.E.; Booher, D.E. Planning with Complexity. In *Planning with Complexity*; Routledge: London, UK, 2018. [CrossRef]
69. Roberts, J.; Scapens, R. Accounting systems and systems of accountability—Understanding accounting practices in their organisational contexts. *Account. Organ. Soc.* **1985**, *10*, 443–456. [CrossRef]
70. Quattrone, P. Management accounting goes digital: Will the move make it wiser? *Manag. Account. Res.* **2016**, *31*, 118–122. [CrossRef]
71. Bovaird, T. Attributing Outcomes to Social Policy Intervention—'Gold Standard' or 'Fool's Gold' in Public Policy and Management? *Soc. Policy Adm.* **2014**, *48*, 1–23. [CrossRef]
72. Ansell, C.; Gash, A. Collaborative platforms as a governance strategy. *J. Public Adm. Res. Theory* **2018**, *28*, 16–32. [CrossRef]
73. Otley, D. Performance management under conditions of uncertainty: Some valedictory reflections. *Pac. Account. Rev.* **2012**, *24*, 247–261. [CrossRef]
74. Forrester, J.W. *Industrial Dynamics*; MIT Press: Cambridge, MA, USA, 1961.
75. Richardson, G.P. Problems in causal loop diagrams revisited. *Syst. Dyn. Rev.* **1997**, *13*, 247–252. [CrossRef]
76. Forrester, J.W. *Urban Dynamics*; MIT Press: Cambridge, MA, USA, 1969; Volume 114.
77. Forrester, J.W. Policies, decisions and information sources for modeling. *Eur. J. Oper. Res.* **1992**, *59*, 42–63. [CrossRef]
78. Morecroft, J.D.W. *Strategic Modelling and Business Dynamics: A Feedback Systems Approach*; Wiley: New York, NY, USA, 2015.
79. Wolstenholme, E. *System Enquiry: A System Dynamics Approach*; Wiley: New York, NY, USA, 1990.
80. Lane, D.C. The folding star: A comparative reframing and extension of validity concepts in system dynamics. In *International System Dynamics Conference*; Shimada, T., Saeed, K., Eds.; Gakushuin University: Tokyo, Japan, 1995; Volume 1, pp. 111–130.
81. Senge, P.; Forrester, J.W. Tests for building confidence in system dynamics models. *TIMS Stud. Manag. Sci.* **1980**, *14*, 209–228.
82. Ghaffarzadegan, N.; Lyneis, J.; Richardson, G.P. How small system dynamics models can help the public policy process. *Syst. Dyn. Rev.* **2011**, *27*, 22–44. [CrossRef]
83. Vennix, J.A.M. *Group Model Building: Facilitating Team Learning Using System Dynamics*; J. Wiley: New York, NY, USA, 1996.
84. Heclo, H. *Modern Social Politics in Britain and Sweden: From Relief to Income Main-Tenance*; Yale University Press: London, UK, 1974.
85. Meseguer, C. Policy Learning, Policy Diffusion, and the Making of a New Order. *ANNALS Am. Acad. Political Soc. Sci.* **2005**, *598*, 67–82. [CrossRef]
86. Muniesa, F.; Millo, Y.; Callon, M. An Introduction to Market Devices. *Sociol. Rev.* **2007**, *55* (Suppl. S2), 1–12. [CrossRef]

87. Reason, P.; Bradbury, H. *The SAGE Handbook of Action Research: Participative Inquiry and Practice*; SAGE Publications: Thousand Oaks, CA, USA, 2007.
88. Morecroft, J.D.W. System dynamics and microworlds for policymakers. *Eur. J. Oper. Res.* **1988**, *35*, 301–320. [CrossRef]
89. Argyris, C.; Schön, D. *Organizational Learning: A Theory of Action Perspective*; Addison-Wesley Pub. Co.: Reading, MA, USA, 1978.
90. Argyris, C.; Putnam, R.; Smith, D.M. *Action Science*; Jossey-Bass Inc. Pub.: San Francisco, CA, USA, 1985; Volume 13.
91. Morecroft, J.D.W.; Sterman, J. *Modeling for Learning Organizations*; Taylor & Francis: New York, NY, USA, 2000.
92. Bianchi, C. *Processi di Apprendimento nel Governo dello Sviluppo della Piccola Impresa: Una Prospettiva Basata sull'integrazione tra Modelli Contabili e di System Dynamics Attraverso i Micromondi*; Giuffrè: Milan, Italy, 2001.
93. Bianchi, C.; Bivona, E. Commercial and financial policies in family firms: The small business growth management flight simulator. *Simul. Gaming* **2000**, *31*, 197–229. [CrossRef]
94. Isaacs, W.; Senge, P. Overcoming limits to learning in computer-based learning environments. *Eur. J. Oper. Res.* **1992**, *59*, 183–196. [CrossRef]
95. Kim, D.H. Learning Laboratories: Designing a Reflective Learning Environment. In *Computer-Based Management of Complex Systems: Vol. Proceeding*; Milling, P.M., Zahn, E.O.K., Eds.; Springer: Berlin/Heidelberg, Germany, 1989; pp. 327–334.
96. Senge, P. Organizational learning: A new challenge for system dynamics. In *Computer-Based Management of Complex Systems: Vol. Proceeding*; Milling, P.M., Zahn, E.O.K., Eds.; Springer: Berlin/Heidelberg, Germany, 1989; pp. 229–236.
97. Lewin, K. Action research and minority problems. In *Resolving Social Conflicts*; Lewin, G.W., Ed.; Harper & Row: New York, NY, USA, 1946.
98. Eden, C.; Huxham, C. Action research for management research. *Br. J. Manag.* **1996**, *7*, 75–86. [CrossRef]
99. Vignieri, V.; Guerrera, A.; Scirè, G. Tourism Governance at Stake: Supporting decision makers in a small town through an Interactive Learning Environment. In *Il Governo Aziendale: Tra Tradizione e Innovazione*; Marchi, L., Lombardi, R., Anselmi, L., Eds.; Franco Angeli: Milano, MI, Italy, 2016; Volume 2, pp. 127–139.
100. Moynihan, D.; Fernandez, S.; Kim, S.; LeRoux, K.M.; Piotrowski, S.J.; Wright, B.E.; Yang, K. Performance Regimes Amidst Governance Complexity. *J. Public Admin. Res. Theory* **2011**, *21* (Suppl. S1), i141–i155. [CrossRef]
101. Ackermann, F.; Andersen, D.F.; Eden, C.; Richardson, G.P. ScriptsMap: A tool for designing multi-method policy-making workshops. *Omega* **2011**, *39*, 427–434. [CrossRef]
102. Saunders, M.; Lewis, P.; Thornhill, A. *Research Methods for Business Students*; Financial Times/Prentice Hall: Englewood Cliffs, NJ, USA, 2007.
103. Hovmand, P.; Rouwette, E.; Andersen, D.; Richardson, G.; Calhoun, A.; Rux, K.; Hower, T. Scriptapedia: A Handbook of Scripts for Developing Structured Group Model Building Sessions. In *Social Science Media*; Radboud Repository of the Radboud University Nijmegen: Nijmegen, The Netherlands, 2011.
104. Andersen, D.; Richardson, G.P. Scripts for group model building. *Syst. Dyn. Rev.* **1997**, *13*, 107–129. [CrossRef]
105. Black, L.J. When visuals are boundary objects in system dynamics work. *Syst. Dyn. Rev.* **2013**, *29*, 70–86. [CrossRef]
106. Giorgino, M.C.; Barnabè, F.; Kunc, M. Experiencing with visuals in accounting education: The case of integrated reports. *The Int. J. of Manag. Ed.* **2023**, *21*, 100809. [CrossRef]
107. Ruggiero, P. No Longer Only Numbers: An Exploratory Analysis of the Visual Turn in Reporting of Public Sector Organisations. In *New Trends in Public Sector Reporting*; Manes-Rossi, F., Levy Orelli, R., Eds.; Springer International Publishing: NewYork, NY, USA, 2020; pp. 105–127. [CrossRef]
108. Miller, P.; O'Leary, T. Mediating instruments and making markets: Capital budgeting, science and the economy. *Account. Organ. Soc.* **2007**, *32*, 701–734. [CrossRef]
109. Miller, P.; Power, M. Accounting, Organizing, and Economizing: Connecting Accounting Research and Organization Theory. *Acad. Manag. Ann.* **2013**, *7*, 557–605. [CrossRef]
110. Alessi, S. Designing educational support in system-dynamics-based interactive learning environments. *Simul. Gaming* **2000**, *31*, 178–196. [CrossRef]
111. Barlas, Y.; Diker, V.G. A dynamic simulation game (UNIGAME) for strategic university management. *Simul. Gaming* **2000**, *31*, 331–358. [CrossRef]
112. Davidsen, P.I. Issues in the design and use of system-dynamics-based interactive learning environments. *Simul. Gaming* **2000**, *31*, 170–177. [CrossRef]
113. Kopainsky, B.; Pedercini, M.; Davidsen, P.I.; Alessi, S.M. A blend of planning and learning: Simplifying a simulation model of national development. *Simul. Gaming* **2010**, *41*, 641–662. [CrossRef]
114. Ceresia, F. A System Dynamics-Based Interactive Learning Environment for Online Formative (Self-)Assessment of Wanna-Be Entrepreneurs' Performance Management Capabilities. *Adm. Sci.* **2023**, *14*, 3. [CrossRef]
115. Barlas, Y. Formal aspects of model validity and validation in system dynamics. *Syst. Dyn. Rev.* **1996**, *12*, 183–210. [CrossRef]
116. Qudrat-Ullah, H. Yes we can: Improving performance in dynamic tasks. *Decis. Support Syst.* **2014**, *61*, 23–33. [CrossRef]
117. Sterman, J. Appropriate summary statistics for evaluating the historical fit of system dynamics models. *Dynamica* **1984**, *10*, 51–66.