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INTEGRATED ASSESSMENT OF OPERATIONS STRATEGY

Abstract. Ineffective evaluation of operations strategy, resulting in negative side effects, is increasingly frequently reported in literature. It is mostly explained by non-integral and inconsistent assessment. Therefore an integrated framework for assessment was conceptualized to eliminate the reported dysfunctionalities. It is based on the paradigm of New Economy, holism, and departs from common but narrowing approaches, which solely focus on the business/company point of view. The proposal applies an ecosystemic perspective, which is fundamental for collaborative networks or when Internet ecosystems are used to drive operations. Both, procedural and cultural foundations are considered in the proposed solution.

Keywords: Operations Strategy, Integrated Assessment, Holistic Assessment

1. Introduction

The importance of operations strategy starts with the market and economic role of operations. In most cases operations secure the main stream of revenues and often bring the largest volume of costs. Similarly, operational assets usually represent the bulk of total assets and absorb the major stack of investments. Operations performance has a great influence on the financial performance, and especially on the return on assets. The excellence of operations becomes critically important when the competitive advantage is built upon cost competition. Operations performance directly drives customer performance, and consequently the market performance and positioning, competitive performance, and comparative positioning. Ultimately the company standing, development and growth, and its value, are conditioned by performance of operations. Therefore the wealth and sustainability of majority of companies depends mostly on the quality of operations strategy. There are many cases confirming the strategic importance of operations strategy – as a key to success, or a main reason for failure.

Operations are among the activities leading to the environmental havoc. Green operations strategy attempts to leverage gains of productivity with ecological performance. Ultimately,

operations strategy contributes to the sustainability by promoting resource efficient, greener, competitive, and inclusive economy, and fostering economic, social and territorial cohesion.

Traditional approach to operations strategy uses a unilateral perspective: it solely focuses on a business or a company point of view; but supply chains provide evidence of shared and collaborative strategies. Alternatively, companies subordinate operations to Internet platforms exhibiting an ecosystemic nature. With this regard the specific approach of Social Credit System should be reflected, which is promoted in China [12]. It presumes a widespread use of performance scores in society and economy. Among targeted areas there are: production, logistics, e-commerce and finance. Example aimed functions are: pricing, tendering, bidding. As yet, the developments are mostly driven by private sector, and are at early stage. The major advantage of Social Credit System is in building trust and credibility. Organizations and individuals which improve their performance are deservedly given better terms of service, as they exhibit a lower risk. Consequently a systemic performance can benefit, what is the key objective. The Social Credit System is actually intended as a systemic mechanism to stimulate behaviors of individuals and organizations, to get improved the overall systemic performance.

The efficacy of operations strategy process depends fundamentally on its assessment. The literature reports increasingly frequently dysfunctional assessments, which are manifested by significant side negative effects of strategic initiatives [8]. The methodological shortcomings, mostly inconsistent and non-holistic assessments, are suggested as the major cause [9]. This paper learns from that research, and reflects on the existing approaches, which can be broadly categorized into procedural [5], and culture based. Of the latter, the Hoshin-Kanri framework exhibits unilaterally positive outlook. However, its cultural conditioning is substantial, and it is often not easy to be met [1]. By consideration of the above inputs methodological requirements were designed, then a framework conceptualized, to secure integral assessments.

The paper is organized as follows. The next section reviews the operations strategy process with regard to the positioning and content of assessment. Section 3 reviews the methodological requirements for integrated assessment. Section 4 presents a framework for integrated assessment of operations strategy. Section 5 concludes and summarizes the paper.

2. Operations Strategy: The Content, Process, and Assessment

Operations strategy is an inheriting extension of superior strategies, accompanied by complementary strategies [Fig. 1]. Primarily, it deploys strategy of a company, network or ecosystem. It is aligned with product, market and customer strategy, and other functional strategies. Operations strategy investigates internal potential for development and

improvements – to exploit it, what goes analytically or through experience and learning. Finally, operations strategy explores anticipated changes in environment – to adapt to them.

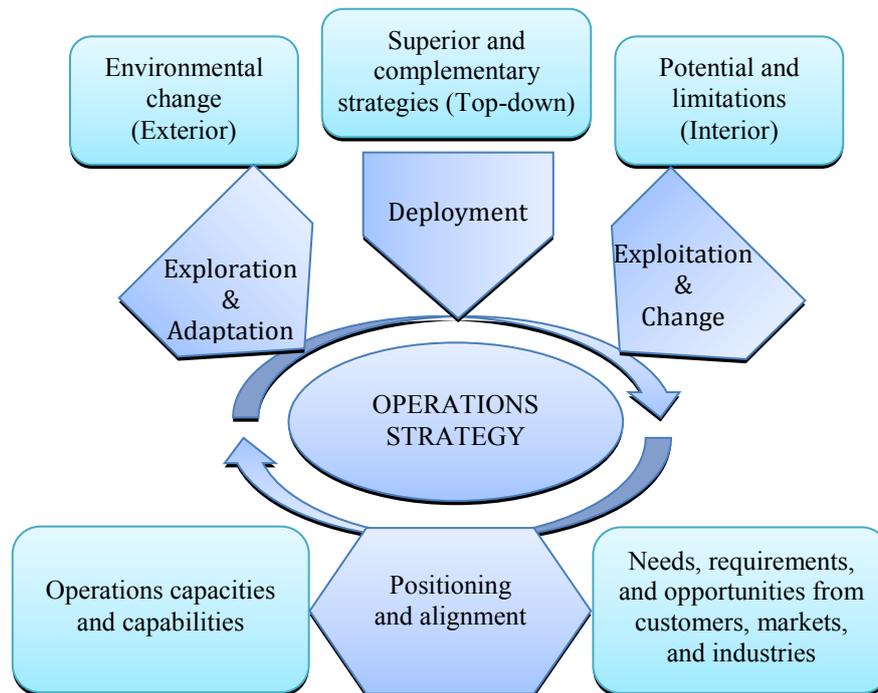


Fig. 1. Core Focus of Operations Strategy

Source: Own development.

The key role of operations strategy is to align the operations capacities and capabilities with the expected needs, requirements and opportunities: from customers, at markets, and in sectors. Another important responsibility along the elaboration of operations strategy is to set and project a competitive positioning, and this way to facilitate comparative advantages. Both key roles of operations strategy require a balance between conflicting concerns: alignment vs. adaptability. With this regard the ambidexterity¹ is an important competence for management control, especially when assessing operations strategy.

Operations strategy is built upon two pillars [Fig. 2]. The first one sets a resource base for capacities and capabilities: it is the whole of assets, processes and technologies that enable to service needs and requirements of clients and markets. By leveraging resources, a competitive and comparative advantage is developed and positioned, including distinctive and core competencies. The setup of resources is supported by the internally focused strategic analysis, and also by an organizational learning from the internal experience. The second pillar represents the external positioning and competence of a firm. Herein the benefits of relationships and resource dependencies are considered, and also the critical competencies that enable development of adequate and innovative response to emerging unpredictable

¹ Ambidexterity is defined as ability of an organization to effectively exploit their existing competencies, while simultaneously explore new opportunities [3]. Also called 'exploitation-exploration balance'.

contexts. The latter comprise: changeability, resilience, ability to learn and share knowledge, improvement and innovation capabilities. The external positioning and competence are supported by the use of externally oriented strategic analysis.

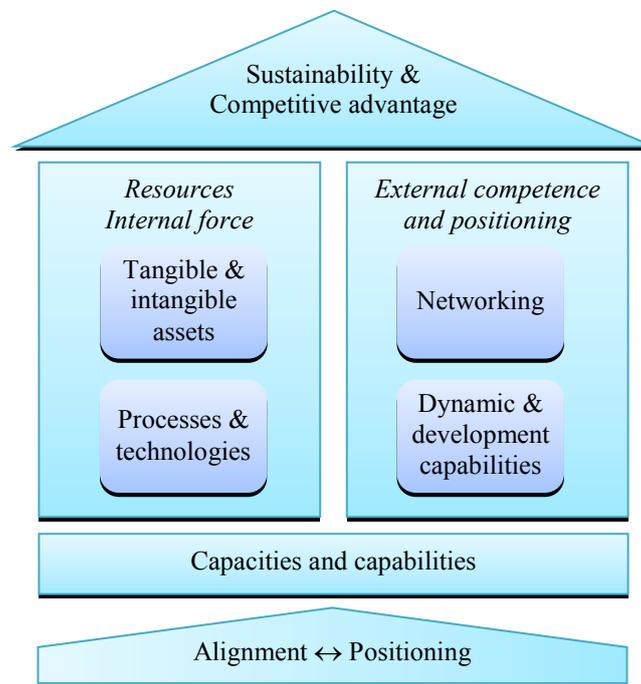


Fig. 2. Contentual Setup of Operations Strategy
Source: Own development.

Altogether, the setup of operations strategy is based on four cornerstones [Fig. 2]:

- tangible and intangible assets: human resources; know-how; fixed assets (configuration, layout, and location); current assets; intangible assets; organizational culture; etc.;
- processes and technologies: primary, support, managerial processes; process technologies;
- networking: relationships; specialization; extrinsic resource dependence; clustering; mutual learning; collaborative innovation; cultural exchanges;
- dynamic and development capabilities: changeability; resilience; learning and cognitive abilities; knowledge sharing; continuous improvement competence; innovating potential.

The contentual setup reflects the theoretical foundations of operations strategy: (i) pillar of resources corresponds to the resource based view, which considers capacities and capabilities as the main source of competitive advantage [2]; (ii) pillar of external competence and positioning corresponds to: (a) the relational view, which seeks competitive advantage in inter-organizational relationships [6]; (b) the resource dependence theory, which focuses on uncertainty in utilization of resources of other firms [10]; (c) transaction costs theory, which

focuses on governance structures of economic exchange [18]; (d) dynamic view, which recognizes the role of capabilities to rapidly and smoothly adapt, reconfigure, integrate, and extend its resources and abilities, in response to the changing needs and requirements [17].

Operations strategy process parallelizes and overlaps other manage processes: strategic management, business planning, performance management, and operations management. Whether the approach is bureaucratic or culture oriented, operations strategy process exhibits a cyclical nature, following the structure of PDCA cycle [11]. This rule also applies to the assessment of operations strategy [Fig. 3]. The deployment of operations strategy, like its assessment, exhibits the ‘top down-bottom up’ sequence [1; 5].

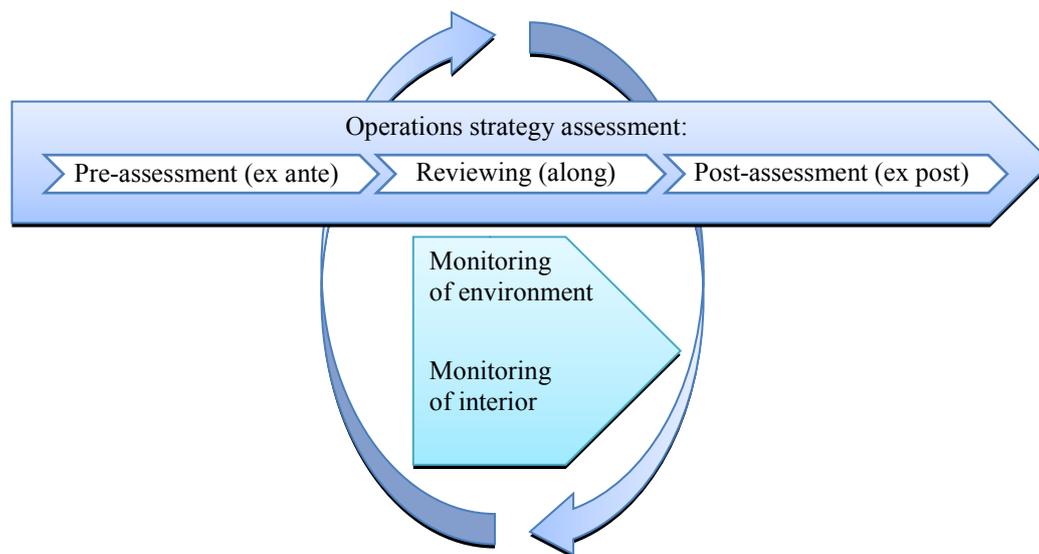


Fig. 3. Linking Assessment of Strategic Initiatives with Operations Strategy Monitoring
Source: Own development.

According to the principles of CSR (Corporate Social Responsibility), which follow the paradigm of New Economy [13], companies should respect interests of internal, network and external stakeholders: owners, other internal stakeholders (management, employees, unions), customers, vendors, partners and collaborators (within a supply chain or in an ecosystem), society, economy, environment. The interests of stakeholders differ, e.g. society has a concern of safety of employment, while business risk is important for owners and management. The internal view for operations strategy assessment focuses on the business aspects. Comprehensively it recognizes three broad perspectives [11]: (i) feasibility: it takes into account affordability of actions; the required investments in terms of time, efforts and resources, and the delimiting abilities, difficulties; (ii) acceptability: it investigates the balance of possible gains and returns from the planned use of resources; (iii) vulnerability: it attempts to assess possible threats and exposures that might appear along strategy implementation. Following the above considerations, a relevant set of perspectives and criteria can be effectively derived, to assess an operations strategy [Fig. 4].

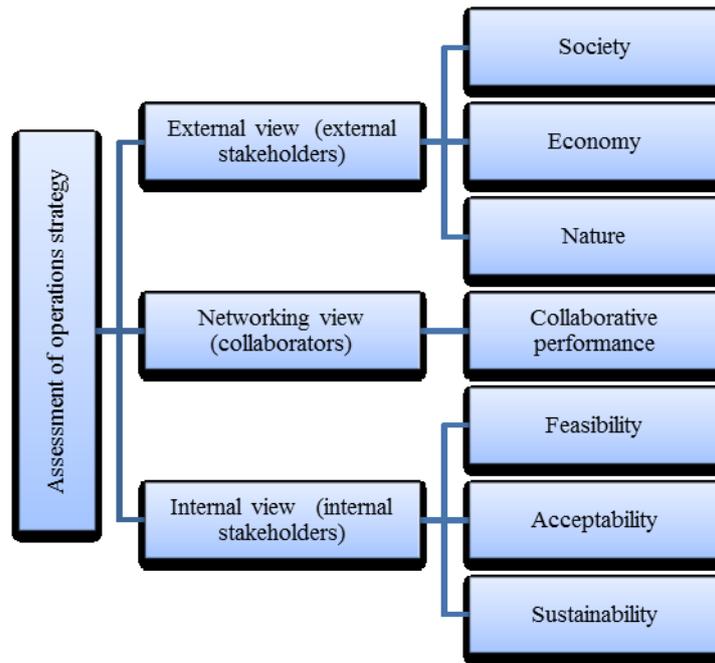


Fig. 4. Perspectives for Operations Strategy Assessment
Source: Own development.

The following types of items can be identified, which are subjected to assessment along the deployment of operations strategy: strategic goals; strategic objectives; strategic initiatives; key success factors (KSF) and key risk factors (KRF); key performance indicators (KPI) and key risk indicators (KRI); targets, milestones, due dates; thresholds and alarms.

The discussion in this section has provided the grounding insights for development of a framework to assess an operations strategy. Another range of considerations, which refer to the methodological setup of assessment, is discussed in the next section.

3. Methodological considerations

Whether operations strategy assessment is viewed a method, process or system, a range of factors has to be considered when designing its setup, to secure viability and soundness.

The aforementioned shortcomings of assessment primarily manifest themselves by side negative effects, which are not anticipated, nor discovered, and often externalized. According to the causal analysis of side negative effects presented in [9], the most significant factors of dysfunctional assessments are: (i) focus on targeted and first momentum effects; (ii) too limited horizon of assessment, i.e. time-inconsistency; (iii) bypassed externalities (e.g. effects manifested in other departments, outside, etc.); (iv) variability and change not considered, especially in the business environment; (v) failing assessment of risk (risk undiscovered or incorrectly assessed); (vi) non-holistic assessment – crucial interdependencies and

discrepancies are ignored, which can be only identified when a whole (company, supply chain, ecosystem) is assessed. The research results presented in [9] also confirm, that even highly sophisticated but inadequate design of assessment does not protect against basic, but significant dysfunctionalities. Consequently, on the basis of empirical evidence, the rationale of existing approaches and methods for assessment can be questioned.

The above discussed dysfunctionalities of assessments expose crucial role of its integrity, which is reflected by two particular aspects: consistency and holism. The integrity of assessment in procedural approaches, that dominate the Western management, relies on systems – the focus is on models, methods and tools, which are used to leverage targets and estimate interdependencies [4; 7; 15]. Organizational culture based approaches appreciate the human competence and attitudes for viability and accuracy of assessment, like in the Hoshin-Kanri framework [1]. A leveraged approach evidently provides a rational solution in any case.

The holistic approach addresses the whole object and subject of assessment, however by selectively taking into account the meaningful interdependencies of effects or factors.

The consistency of assessment can be structured into three dimensions [Fig. 5]:

- time-related consistency – possible effects, along time or life-cycles, are considered,
- spatial consistency – externalized effects or factors, are recognized,
- scope consistency – effects manifested in various sub-scopes are considered.

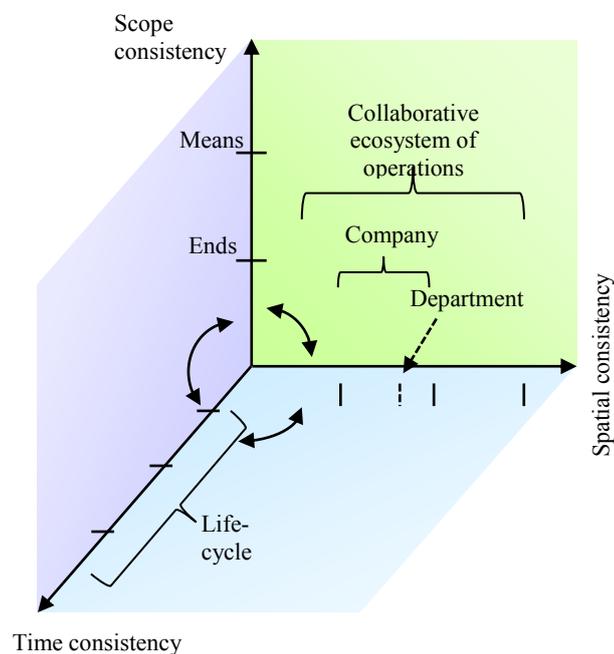


Fig. 5. Consistency of Operations Strategy Assessment – Key Dimensions
Source: Own development.

Extending the above discussion by reflecting on the knowledge concerning assessment of strategies [4; 7; 11; 15], reveals importance of particular fits, which altogether condition the proper setting of assessment. This comment especially applies in reference to the integrity and leverage of assessment, and in particular with regard to trade-offs, ambidexterity, other critical discrepancies and interdependencies, as well as efficacy of assessment. Otherwise, the side negative effects may significantly lower the gains from operations strategy implementation. Altogether twelve fits have been identified, which are discussed below.

1. Contextual fit

The prior determinant of assessment is its context. It conditions the purpose and subject of assessment. With regard to the continuity of assessment, two common contextual settings can be identified. The first is defined by ongoing processes of manage and control, which can be exemplified by performance management, controlling, or another approach. In any case major attention is given to monitoring of performance measures, which are used as the controllables. Decisions making provides another context. The subjects herein may vary from a whole strategy, through a singular initiative, to a minor but strategically important improvement.

2. Perspective alignment

This fit sets the lenses of assessment, which are primarily determined by the viewpoints of stakeholders, and correspond with the contextual setting [Fig. 4].

3. Scope fit

The setup of assessment should recognize the two-dimensional scope adequacy, i.e. with regard to the means and ends [Fig. 6]. The first dimension includes those capabilities and capacities that lead towards objectives. It reflects the contentual structure of operations strategy, and is supplemented with the module of resilience. The lagging scope contains such areas, where the planned results are manifested. It also includes the module of vulnerability. The primary effects of operations strategy are reflected by the operational and collaborative performance. The secondary impacts are in the market, customer and competitive performance. The tertiary effects are manifested by capital turnover, financial performance, and company growth. Also the side impacts of operations on products are considered. Finally, the social, ecological, and economic aspects are considered. The latter can be assessed by drawing from the internal economic performance. It must be underlined that normally separations of the two sub-scopes are conditional, i.e. subjective. In some contexts particular metrics of performance can be viewed oppositely than it is set in the reference model.

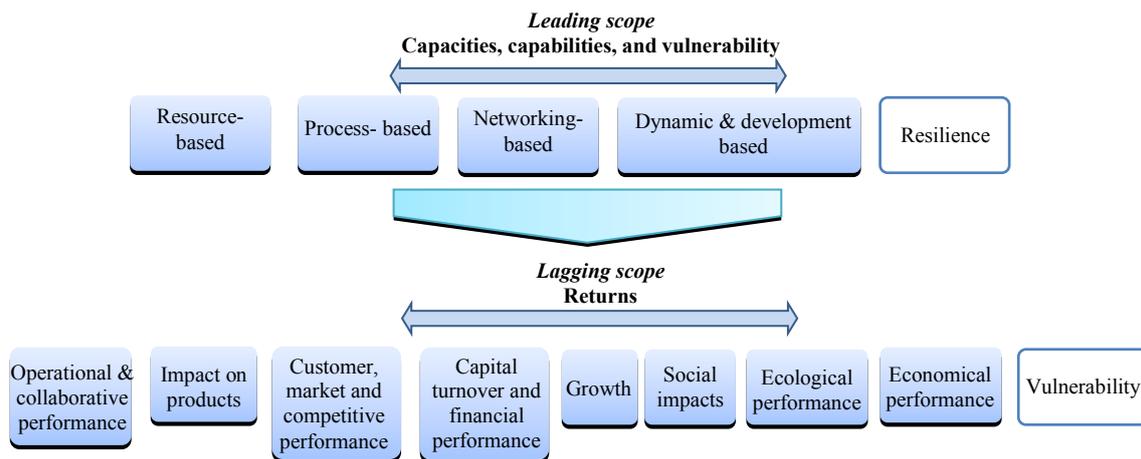


Fig. 6. Model of Scope for Operations Strategy Assessment
Source: Own development.

4. Spatiotemporal fit

The design of assessment should be tailored by its spatiotemporal extent. The major dimensions herein are the spatial latitude, and the timeframe. The former may vary from organizational units, through supply chains, to the production ecosystems. The latter is typically bound in time. Sometimes it is punctual. Otherwise, whole life-cycles may be addressed.

The four basic fits discussed above, should be complemented with other eight, to fully secure relevance, coherence and holism of assessment. These are not necessarily disjunctive:

5. Fit to the existing management and control paradigms or approaches (e.g. technocratic vs. human-led, commanding vs. inclusive, etc.);
6. Cultural fit, i.e. to the organizational culture, and possibly to national or regional ones;
7. Methodical fit: it is conformance of assessment with the manage processes that are supported by organizational systems, procedures, methods and tools;
8. ICT fit, i.e. to the available support from information and communication systems;
9. Measurement fit: it is the consistency of applied metrics with measured characteristics;
10. Granularity-aggregation dilemma: too narrow partial assessments or too aggregated metrics increase the effort of assessment, and the difficulty to address complexities; partial measures may also delimit the diagnostic and directing power of assessment;
11. Variability and uncertainty fit: it is about the conformance of systems and methods used to assess, with the existing or expected characteristics of variability and uncertainty;
12. Complexity fit: it reflects whether the setting of assessment adequately considers known trade-offs, ambidexterity, and all other critical interdependencies of effects and factors (holism).

The rationality of assessment can be also bounded by other factors, like the limited data provision, discordance of expectations and measures, weak coherence of models used for assessment with reality, failing estimations of interdependencies et al.

To note, the setup of assessment also conditions its efficacy.

4. Integrated Assessment of Operations Strategy

A comprehensive framework for assessment of operations strategy should primarily respect the scope fit, i.e. following the two-dimensional scope adequacy. Additionally, the consistency of assessment has to be secured. With this regard the model scope of operations strategy assessment can be applied as the founding frame, which was elaborated in the preceding section [Fig. 5]. Followingly, after in-depth reflection of available knowledge [4; 7; 14; 15], a comprehensive scope model to assess operations strategy was elaborated [Table 1]. As the separation of leading and lagging scopes is conditional, redundancies occur herein.

Table 1

Reference Model of Scope for Operations Strategy Assessment

Leading scope (means)	
Resources	Competence baseline; Productivity; Inventory turnover; Energy consumption; Flexibility; Dependability
Processes	Lead-times; Throughput; Yields; Flexibility; Process variability
Networking	Network connectivity; Transaction costs; Purchase costs; Network completeness; Network variability
Dynamic capabilities & capacities	Lead-times; Operational flexibility; Engineering flexibility; Reconfigurability
Development capabilities & capacities	Time-to-order; Time-to-market; Innovation performance
Vulnerability	Operational risks metrics [1]; Operational liquidity;
Lagging scope (ends)	
Operational and network performance	Dependability; Reliability; Volume and mix flexibility; Operational variability
Impacts on product performance	Material costs; Customizability and intimacy; Durability; Maintainability; Reliability; Health exposures; Energy consumption
Customer, market and competitive performance	Customer service; Customer satisfaction / retention; Sales; Market shares
Capital turnover and financial performance	Availability metrics; Capital turnover ratios; Financial liquidity; Value-added performance; Costs of goods sold; Profitability
Growth	Growth ratios; Maturity models
Social performance	Accidents; Customers' & employees' morbidity & mortality morbidity; Absenteeism; Average wages; Salaries of sick staff; Unemployment ratios;
Economic performance	Expenses-to-purchase given value; Credit behavior and solvency
Ecological performance	Waste; Emissions; Depletion of non-renewable resources; Ecological tariffs and taxes paid; Design of products to ReX [14]; Degradability of products
Resilience	Operational resilience; Exogenous variability; Exogenous disruptions

Source: Own development.

The above model should be understood as an open framework, but not as a rigid standard. It can be adapted, modified and extended according to local needs and requirements.

Other important factors for viable and sound assessment are consistency and holism. Both together secure the integrity of assessment. The overall embedding of operations strategy assessment is determined by its contextual positioning within the processes of overall and partial strategies. Furthermore, the assessment of operations strategy is embedded into its deployment, including evaluating, prioritizing, selecting, and leveraging strategic means and

ends. Consequently, the frame for operations strategy assessment reflects the process of operations strategy deployment [Fig. 7]. The prior input to the assessment is strategic goals. Then iterative cascading through the consecutive layers of hierarchy and granularity takes place, applying every time the deployment quadruple of ‘objectives → initiatives → performances and abilities → controls’, and following the ‘top down-bottom up’ loop. It finalizes with approval of the strategic plan. Additionally, the reviewing of operations strategy is embedded in the strategic control. The ongoing active monitoring also requires relevant performance measures, and ICT resources. Therefore the controlling of operations strategy can be also viewed throughout its embedding into the performance management.

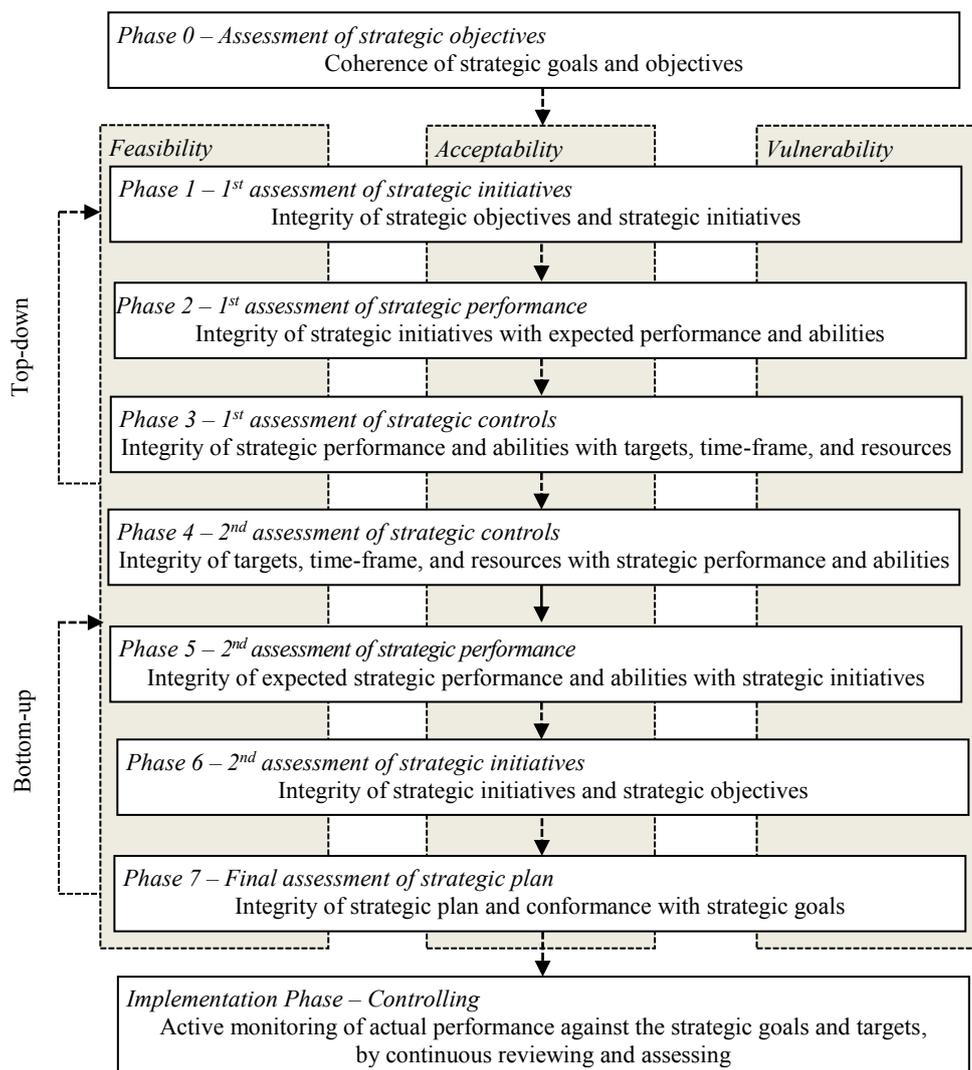


Fig. 7. Reference Model of Process for Operations Strategy Assessment
Source: Own development.

With regard to the integrity of operations strategy assessment, another important concern is the assurance of consistency and holism. This applies along and across the core cascades of deployment, which are: (i) exploding and cascading objectives, initiatives, and outcomes;

(ii) detailing and cascading measures; (iii) detailing and cascading targets; (iv) detailing and cascading time-frames; (v) assigning resources.

The integrity of assessment can be assured at any level of deployment by consistency checking and leveraging means with ends. Both functions can be facilitated by: (i) relevant use of competence and creativity; (ii) use of adequate measurement models, methods, and tools; (iii) appropriate decision making; (iv) adequate organizational setup.

The main steps of reverse deployment, i.e. the bottom-up directed, are: (i) consolidation of resource inputs; (ii) aggregation of outcomes and targets; (iii) aggregation of vulnerabilities and risks; (iv) consolidation and leveraging of action plans. The integrity of assessment along the reverse deployment provides similar issues, like the downward one. Therefore, similar methodological and organizational countermeasures can be applied in this case [Table 2].

Table 2

Means to Assure Integrity of Operations Strategy Assessment

Step	Outputs	Means
Deployment (top-down) – one iteration		
Identification	Setting of initiatives coherent with objectives	Creative thinking Qualitative modeling
Cause-effect linkage 1 st iteration	Map of objectives, initiatives and outcomes	Influence and scenario modeling
Consistency checking	Side effects and perils	Influence and scenario modeling
Cause-effect linkage 2 nd iteration	Map of objectives, initiatives and outcomes, including side effects or perils	Quantitative modeling
Leveraging	Schedules, priorities, targets, baselines, bills of resources	Quantitative modeling Optimization Simulations and games Analytical Hierarchy Process Multi-criteria Decision Making
Reverse deployment (bottom up) – one iteration		
Consolidation of resource inputs	Bills of resources	Quantitative modeling
Aggregation of expected performance	Targets, baselines	Quantitative modeling
Aggregation of vulnerabilities and risks	Vulnerabilities and risks assessments	Quantitative modeling
Consolidation and leveraging of action plans	Schedules, priorities, targets, baselines, bills of resources	Quantitative modeling Optimization Simulations and gamifications Analytical Hierarchy Process Multi-criteria Decision Making

Source: Own development.

The two common approaches concerning the organizational setup of deployment are:

- functional approach: it relies on matching the deployment with organizational hierarchy,
- program/project based approach: herein separate programs or projects are applied as the vehicles to drive particular strategic initiatives.

Both of these approaches can be adapted when the scope of assessment goes beyond one company, i.e. with regard to supply chains or ecosystems.

According to literature, the project-based approach secures high integrity of complex actions, including the performance aspect [7]. However, the recent research calls this opinion in question [9]. Oppositely, the Hoshin-Kanri framework that matches organizational hierarchy stays effective, at least when applied in the Japanese industries [1]. It is the organizational culture, and in particular the holistic commitment and skills, that really counts. This thesis also extends to partnerships. Therefore, the adequate attitudes and competence of employees and partners, appear to be the critical success factors for integrated assessment. Finally, another one is holism - the 'selective adequacy' along identification and evaluation of interdependencies between the means and ends. Again, the holism of assessment relies rather on competence and attitudes of experts, than on the methodological or organizational conditioning. Also the spatiotemporal extent of assessment provides another challenge – with regard to the availability of information and possible tracking.

5. Final Remarks and Summary

This paper conceptualizes a comprehensive and integrated framework for assessment of operations strategy. It is based on the paradigm of New Economy, and departs from the common but narrowing approach, which solely focuses on the business/company point of view. This is by applying the ecosystemic perspective, which is crucial for collaborative networks, or when an Internet ecosystem is used to drive operations. Both, procedural and cultural foundations are considered in the proposed solution.

The framework was derived from reflection on the existing approaches, and conclusions from the empirical research and root causing of identified shortcomings. The integrity of assessment is facilitated by its consistency and holism. With this regard three reference models have been conceptualized, including the models of scope and process, and the model of means to assure integrity of assessment. The proposed framework can be tailored and adjusted according to the situational needs, requirements, constraints and context.

A limited proof of the concept was performed through case studies, which is not presented herein due to the limited space of this paper.

The future work should go towards detailing and extension, further validation, and possibly standardization.

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