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EXPLORATORY STUDY OF THE INCLUSION OF TERRITORIAL RESOURCES IN DESIGN PROCESS

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ABSTRACT

This article describes an exploratory study of the inclusion of territorial resources in a business's value-creating process through the application of a global and systemic ecodesign approach. Incorporation of these new resources will enable businesses to improve their global performance. The context and the issues are described, after which we proceed to outline a theoretical model illustrated with examples of successful implementation that substantiate our presentation.

Keywords: eco design, sustainability, design methods, territorial resources

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1 THE CONTEXT

The definition of business performance has evolved in the last few decades alongside the evolution of economic models, regulatory constraints and consumer expectations.

Economic models have evolved away from the linear value creation chain (supplier-business-client) to network models, also referred to as "value constellation" models (Normann, 1994). The factors that create value have likewise evolved, from strategic positioning on the value creation chain in relation to competitors (the Porter model) to the creation of new value through restructured relationships between stakeholders, who have become co-producers of value (Allee, 2000), (Normann, 1994). Organizational innovation has come to be a key factor for company and its stakeholders in a changing, competitive and constrained environment.

This evolution in the importance of the stakeholder has led to a change in distribution models, with a single measure of performance (economic performance) aimed at the shareholder being replaced by a multifactorial performance aimed at a larger number of stakeholders. Global performance has been defined by (Baret, 2006) as the combined sum of economic, social and environmental performance and has the appearance of a measure of the achievement of sustainable development. (Neely, 2007) defined business performance as the process of value creation that satisfy stakeholders' needs and expectations even though these may not be of equal importance. This stakeholder-centric approach, based on value creation, can be transposed to a global performance approach. In fact, Wheeler, Colbert and Freeman (2003) argue that a business model based on value creation is capable of accommodating the notion of corporate social responsibility, sustainability and stakeholder involvement at different levels within the business (i.e. strategic and managerial).

From an operational perspective, industrial performance is currently measured by the triptych cost time quality. The efficiency of manufacturing systems is optimized by adopting "lean"-type techniques (for example lean manufacturing, aimed at eliminating losses and wastes in the manufacturing process resulting from inefficient use of human and material resources and poor time management). Approaches of this kind have enabled manufacturers to differentiate themselves from their competitors by optimizing quality and timing elements (just-in-time, total quality, etc.), leaving cost as the only measure of value added to the product or services offered.

The dominance of cost as a factor in decision making together with the globalization of markets has impelled businesses to relocate production to low-cost countries, sometimes to the detriment of quality and timing. The countries concerned have however responded to the challenge and are now able to offer products in line with the market's expectations.

Having lost the cost-quality-timing battle, European manufacturers need to find new ways of differentiating themselves. Pressure from civil society (regulations and consumers) is opening up new markets for products that satisfy other demands (e.g. environmental quality, respect for labor rights). These new values embedded in the product are for the most part intangible and create extra value for the customers (e.g. esteem value, membership value). Environmental and societal criteria are becoming factors creating value for businesses and one of the drivers of their current and future performance. Proximity as a component of the response to customer demand is becoming another important differentiator for business. Proximity as a response to the demand for a specific product may include mass customization, proximity of brand values (e.g. protecting biodiversity, fair trade) or cultural proximity (e.g. tradition, ties to the territory).

The product development process is central to the business's value-creating network and interacts with the business's other internal processes (e.g. HR, purchasing, strategy). The main object of our research is to provide designers with access to the territory's resources, with a view to enhancing the product's environmental character and improving the business's global performance. Our work is concerned with the development of an integrated tool that will extend the traditional strategic analysis process to include territorial intangibles and make them available to designers.

2 ANALYSIS OF THE IDEAL PROPOSAL AND THE KEY ISSUES TO ACHIEVING IT

In this section we begin by setting out our ideal model in order to implement our proposal. These ideas will be illustrated with the help of some successful examples.

2.1 Ideal proposal and scientific positioning

As seen previously, innovation in organization and value proposition are keys to business development. (e.g. blue ocean strategy¹ or business model generation²) propose frameworks that challenges business model thanks to a questioning on value creation. These frameworks are dedicated to top management as they help creating new business models and related strategies. Our work is not dedicated to innovation in business models. Our method aims at support co-creation of value for the company and its territory thanks to designers' activities.

Our basic hypothesis is that the substitution of territorial resources for external resources within the business's internal value-creating network may help improve the global performance of the company/territory system. Our ideal business would make use of the territory as a reservoir of resources which would be included in all decision-making processes. So it is the internal stakeholders who will be incorporating these resources in the course of their daily activities and in so doing may directly influence the environmental and societal impact of the business. The business thus incorporates positive and negative externalities into economic processes (Vileanu Paun, 2010) and so becomes a participant in the process of its own accountability, as measured by its global performance. Since the design process is the determinant of 80% of a product's environmental impact (De Winter, 1994) the authors are of the opinion that it warrants special attention.

A design process is a cooperative combination of basic activities mobilizing two distinct types of input, resources and skills, to produce a result or an outcome that has value for an external client (Lorino, 2006). We do not intend to make that distinction here; we propose to treat "resources" as a generic term encompassing the tangible and intangible factors that create value (raw materials, energy, finance, etc.), some of them inseparable from the stakeholders who own them (skills, knowledge, etc.). Although focusing on the design process, we consider that processes associated with support functions (e.g. human resources, administration, R&D) and strategy have a key role to play, in identifying territorial resources, capitalizing them and making them available to designers. Our systemic approach is based on value-creating networks, focusing on stakeholders and the resources of the extended business and its territory. The authors define value-creating networks as the nexus of the formal and informal processes that transform tangible and intangible resources within the business (e.g. the product development process, human resources process, strategy process).

The value concerned is the value that is incorporated into the product/service by its design and by the network that has made that process of design possible (e.g. respect for ethical values, respect for the environment, identity-related aspects of the product). This added value increases the product's value in use and in particular its esteem value. We see our work as contributing to a partnership approach in which all of the stakeholders are contributors to the processes of value creation and value distribution (Charreaux and Desbrière, 1998).

Our ideal model aims to provide designers with the means of achieving the effective incorporation of certain resources that are vehicles for these values into their design activities. These resources will be made available to designers through the activities of the business's support functions and a clear policy supported by appropriate strategies and management tools.

2.2 Functional analysis of the ideal model: key issues

With the aim of making territorial resources accessible to designers, we have adopted a top-down approach (i.e. strategy to operation). Strategic processes are in fact creators of value and are intended to modify the way the business adapts itself to its environment by exploiting resources which, in the right circumstances, have the potential to generate sustainable competitive advantage (Lorino, 2006). From this perspective, the inclusion of territorial resources in the business's value-creating networks can provide a potential source of differentiation.

Our method (Figure 1) will serve to identify a business's resources and internal stakeholders, on the one hand, and its territorial resources and associated stakeholders, on the other (F1). This information is incorporated into the value-creating networks (F2) to the design process. The outcomes are assessed and exploited internally and externally using a global management tool suited to intangibles (F3). Valuation of the results concern to two groups: top management and shareholders with regard to the

¹ <http://www.blueoceanstrategy.com/>

² <http://www.businessmodelgeneration.com/>

strategic direction of the company, and the company's internal and external stakeholders having an interest in the global performance of the company and its progress.

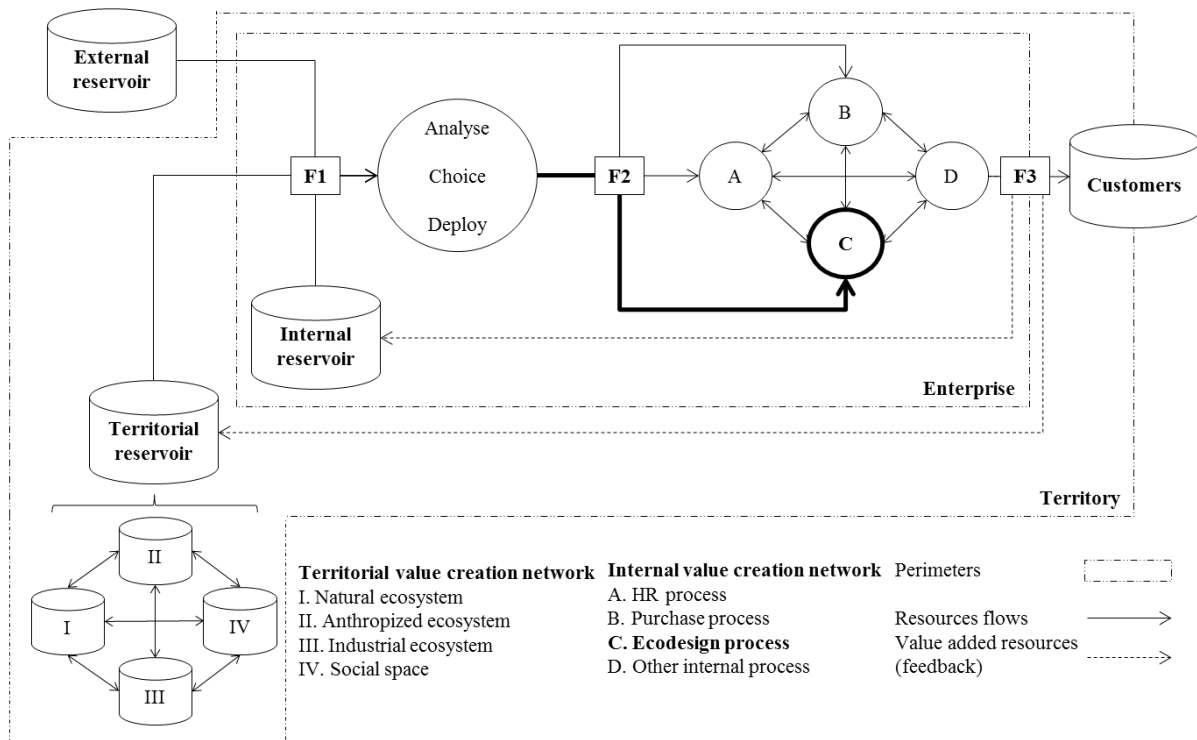


Figure 1. Functional analysis of our model

The territory is an evolving complex system, which combines a geographical space and a set of actors. The objects we use in our analysis are the natural ecosystems (e.g. natural amenities, natural resources), the anthropic ecosystems (e.g. communication network), industrial ecosystems (e.g. expertise, reused resources) and social space (e.g. network of relationships, organizations) (Moine, 2006). There are fluxes of tangibles and intangibles resources between these ecosystems that are creating added value for the territory. The aim of our ideal model is to connect the company to this territorial value creation network. The company is also considered as a complex network of relations where resources flow from internal reservoir to customers.

2.3 Aim of the article

The aim of this paper is to draw attention to the way in which territory can be part of product design (F2) and the nature of the added value that may be achieved (F3). We begin by describing the intangible management tool. We will then look at how these new resources may impact the design process. Finally, we illustrate our argument with two examples of successful application.

The management and evaluation framework

As considering intangible values, the scorecard needs to be expanded to include the company's intangible value creation factors. There are numerous models that take intangibles into account e.g. triple bottom line accountability (i.e. profit, people, and planet (Elkington, 1997) or Porritt's five capitals (2006) to measure sustainability (i.e. natural, social, manufactured, human and financial)). There is a large consensus on the need to integrate a wider set of assets to manage sustainability. (Fustec et al., 2012) propose an intangible scorecard based on assets that are considered as necessary and even sufficient for creating value within the company. It is a closed list of 10 assets (Table 1) that are evaluated using a range of quantitative and qualitative indicators. The anthropocentrically utilitarian outlook that dominates the structure of these tools is open to criticism as well as the capitalist paradigm that is embedded.

Table 1. Closed list of different forms of capital (Fustec et al., 2012)

Client capital	Human capital	Partner capital	Organizational capital	Knowledge capital
Societal capital	Natural capital	Brand capital	Information system capital	Shareholder capital

According to the way in which the first reference model is structured, the environment is considered either a source of risk (supply risk) or a potential inducement to employees (attractive climate). The authors have chosen to retain model's general structure while modifying the indicators applicable to environmental and societal capital to endow them with heritage value. The authors argue that these collective goods affected by the company's activities must be maintained or restored by the company. Alternative indicators have been adopted from a critical review of GRI indicators³, WICI⁴ publications, (Azar, 1996)'s the socioeconomic indicators and other works of the Kaieteur Institute⁵ and (Mercier-Laurent, 2011). The expanded scorecard that has emerged from this review will form the subject of a future paper.

This article is concerned more specifically with the impact of resources on the design process. (Boyle and Duffy, 2009) highlight that the availability of new resources significantly influences the design process. In their definition of the design process, these authors draw a distinction between active and passive resources. Passive resources (inputs) are used by active resources to achieve an outcome (output) that has added value in relation to an objective. The authors examine how new resources are included in design activity. We propose to link their model to the reservoirs of resources identified by our method (i.e. customer, internal, territorial or external reservoir (Figure 2). Solid arrows represent the input in the internal stakeholder's activities and dotted arrows stands for the feedback (shared value).

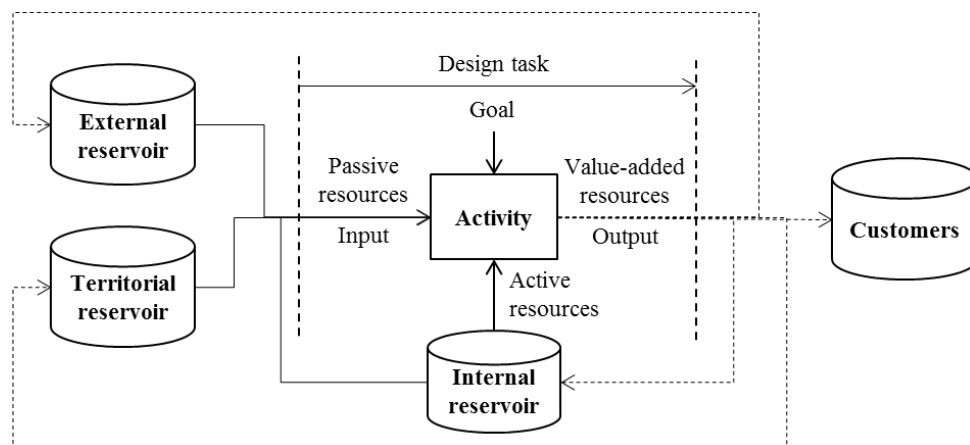


Figure 2. Design activity and reservoirs, adapted from (Boyle and Duffy, 2009)

With a view to improving the company-territory's' global performance, we propose that, where possible, active and passive resources derived from reservoirs external to the territory are replaced by resources from within the territorial reservoir. We will then be in a position to identify the source, the trajectory and the destination of value flows. Fluxes are of multiple natures: material, economic, intangibles... and can be assessed by our intangible scorecard (i.e. measuring the level and quality of assets in the reservoirs).

In order to illustrate our ideal model we will consider two examples of businesses that have benefited from incorporating the territory into their value-creating networks.

2.4 Two successful examples

In this part, authors attempted to validate their hypothesis that the inclusion of territorial resources in the various stages of the product development process could have beneficial consequences for the global performance (i.e. economic, social and environmental performance) of both the company and its territory.

³ <https://www.globalreporting.org/>

⁴ <http://www.wici-global.com/>

⁵ <http://www.kikm.org/>

Approach and method

First, authors selected two companies that used territorial resources into their business. Then, these examples were studied and documented using corporate websites, reports on sustainable development and an inquiry into the knife manufacturer. Finally, authors propose a qualitative evaluation of the global performance improvement for both company and territory.

Introducing the companies

We chose two companies strongly different: field of activity, size, structure, motivation, customers... a traditional knife manufacturer and a multinational firm in the sector of construction materials. These companies were selected because of their thinking on the contribution of territories on their business. One is involved in the field of industrial and territorial ecology and the other communicate on innovation and heritage.

Table 2 – Details of case study subjects

	Workforce	No. of production locations	Turnover
Knife manufacturer	80	Single location at Laguiole	€4.7 million
Cement manufacturer	68,000	1604 production locations	€15.2 billion

Motivation

Both have succeeded in creating value by incorporating territorial resources into their value-creating networks although they had various original motivations.

The cement manufacturer is a major consumer of fossil energy. High and fluctuating energy costs and environmental regulations⁶ are its main drivers for change. Fossil fuel dependence has been analyzed by top management as a threat for the sustainability of the cement activity. So the group adopted the strategy to search for territorial alternatives to fossil fuel energy sources. This strategy was deployed across the group, each production location coming up with a tactical approach tailored to the territorial resources available to it.

The knife manufacturer *Forge de Laguiole* is linked to its territory by its very nature. The Laguiole knife was invented in the village of Laguiole in 1829 (Angeon, 2008). As the "Laguiole" name has never been registered as a trade mark, customers may find Laguiole knives with a large variety of production location, quality and cost. In response to the destruction of territorial culture, Forge de Laguiole has constructed its own identity on the combination of "territory and heritage" and innovation. These are company's two core factors of differentiation. The motivation of the head of forge de Laguiole is to preserve this culture and "create employment in good conditions for the workforce within the territory". The company's policy is reflected practically in, for example, a so-called "snail shell" tactic for the purchasing, in which the principle of proximity has primacy, ahead of environmental considerations and cost criteria.

An analysis of the two cases

A number of different tactical approaches have been employed by the cement manufacturing group, according to the territorial resources available. The fossil fuel alternatives chosen are obtained from different territorial reservoirs and come with their own specific problems. In France, the alternative fuel is industrial waste; in China, the Zunyi cement works burns urban waste; and the Bath cement works in Canada produces fuel crops for energy supply.

These different approaches can be described using our "intangibles-expanded balanced scorecard" to establish the added value of these operations (Table 3). Because of the unavailability of information and the stage that our research has reached we have not been able to complete all sections of the scorecard.

We can see that alternative resources provide intangibles and tangibles values for both the company and its territory. It is to be noticed that industrial processes had to be modified to adapt to alternative resources (e.g. preprocessing or addition of dust filters).

In the case of the knife manufacturer, the influence of territorial resources is more intimate: they are the product's inspiration. The "territory and heritage" component is embodied in the company's strong territorial identity: the Laguiole knife has a history behind it and is more than just the artifact of steel and horn. In fact, the knife incorporates a large number of values (e.g. heritage, culture, patrimony,

⁶ <http://ec.europa.eu/resource-efficient-europe/>

quality, know-how, identity) that are promoted and reinforced by other products of the territory (e.g. local varieties of cheese and meat with a protected designation of origin), by the basket of goods (Roux, 2006), (Angeon, 2008), and even by the territory itself.

Table 3. Three local tactics to fulfill the cement group strategy targets and theirs valuation

	La Couronne (France)	Zunyi (China)	Bath (Canada)
Initial resource	Fossil fuel	Coal	Coal and petroleum coke
Source reservoir	External / natural reservoir	External / natural reservoir	External / natural reservoir
Alternative resource	Industrial wastes	Household waste	Fuel crop
Alternative source reservoir	Territorial / industrial ecosystem	Territorial / anthropized ecosystem	Territorial / anthropized ecosystem
Economic gains	Reduced fossil fuel costs	10% improvement in fuel costs (2013)	
Natural heritage	Reduction of fossil fuel consumption	Valuation of 28.000tons of waste	Reduction of 1,000t of CO2 emissions (test phase, 2010)
Relational capital		Long-term partnership agreement with the town	
Societal capital		40 jobs created	
Other intangible capitals	N/A		

The company has a strong commitment to working with individuals (i.e. labor force, suppliers and distributors who share its values) with the object of communicating those values to the consumer. The values of "territory and heritage" are expressed in the work of designers whose brief has been to update the brand's traditional models to satisfy contemporary tastes. Product design is outsourced to designers and style consultants including Philippe Stark or Jean-Michel Wilmotte. These resources, external to the territory and with a wealth of skills of their own, are tasked with incorporating the territory's social space through its culture and its history. The object embodies both the values associated with the territory and the modern values introduced by the designers (e.g. materials, color, form) (Table 4) to meet customers wants.

Table 4. Design activity and associated reservoirs

Passive resources (Input)	Active resource	Goal	Output
Traditional inspiration from territorial reservoir / social space and innovation from human capital/skills	Designers from external reservoir and traditional know-how from human capital/skills	To marry heritage and innovation	New knife design for clients with territorial heritage embedded.

This illustration shows that integrating intangibles values coming from the territory (i.e. tradition and know-how) can provide added value to customers and become a differentiator for the whole company.

Critical analysis of results

The first limiting factor, as far as our case studies are concerned, relates to the reliability and comprehensiveness of the information used. This information was in fact obtained mainly from the companies' commercial websites and has not been subjected to critical evaluation. The inquiry with the head and some employees of the knife manufacturer, although very informative, is not enough to provide us with the multi-perspective and systemic view that consultation with other stakeholders (internal, territorial stakeholders) would have offered. We only observed a part of the territorial value creation network. In both cases, added value has been assessed on a qualitative basis only, and no formal methodology was used. Upcoming work on evaluation of natural capital will help us overcome this significant limitation.

Conclusions from the examples of successful application

The object of providing these case studies was to illustrate the proposition that the global performance of the business-territory system may be improved by the inclusion of territorial resources in product development processes. Reservations apart, in the case of the cement manufacturer, the system's environmental and societal performances were improved (e.g. fossil fuel resource consumption, employment, knowledge). The global cost of these operations is unknown. Some aspects such as brand image and territorial linkage have been positively impacted, but we lack the means of confirming this at present.

In the case of the knife manufacturer, the territory is the company's principal differentiating factor, evidenced in its cultural, historical and know-how aspects. In this very particular case, the territory is an intrinsic value of the business. The company creates value synergistically with its territory on its own behalf, for its clients and for its territory.

3 THE MODEL PROPOSED

In this section we describe in detail how the approach is implemented within a business. The model we propose aims to eliminate following issues: the first concerning knowledge and management of the business's internal and external intangible resources; the second concerning the inclusion of these resources in the business's value-creating networks; and the third concerning the evaluation and valuation of the added value offered by action plans both internally and in relation to the territory.

For ease of understanding, the implementation process is divided up into a number of stages. The order proposed is chronological and iterative, and within each stage, more than one activity may be implemented at the same time.

The first stage of our method, strategic analysis, aims to provide decision makers with extra information to classical analysis (market, positioning, etc...). It assumes that the systematic consideration of local resources should help defining strategies to improve the overall performance. Strategic analysis involves a number of distinct activities that can be carried out in parallel.

The first activity involves mapping the business's value-creating networks. The object is to increase the body of knowledge relating to the links between value-creating processes inside the business (e.g. HR, R&D, logistics). This internal network is the mapping of the flow of resources from one reservoir to another (e.g. from internal stakeholders to databases). It is then connected up to the reservoirs of external resources (e.g. suppliers, customers) and to the external value-creating networks (e.g. professional network, university). This activity helps to identify the set of stakeholders relevant to the business.

The activity of stakeholders' integration into strategy definition must be done synergistically with the preceding task. It consists in identifying their needs and expectations and their contribution to the achievement of objectives (based on (Neely, 2007, p.155)). The stakeholders' perimeter defined previously by the value-creation network is extended to include "untouchable assets" (i.e. assets that create value but require protection). As example, environment is considered to provide resources or value (e.g. raw materials, ecosystem-related services, recreation), but it suffers the negative externalities associated with the business activities (e.g. pollution, exhaustion of resources). This extension of the scope of stakeholders and associated values relies on new governance methods for the overall performance.

The purpose of the business governance evaluation activity is to improve the level of knowledge of decision makers. Authors hypothesize that including the management of intangibles is a necessary but not sufficient requirement for the successful integration of sustainability in business. Governance is characterized by its levels of sustainability integration ("aspiration") and intangibles integration ("means"). Two analytical matrixes have been developed and provide decision makers with information about the company's level of maturity of both sustainability and intangible integration into governance.

Another aspect of this strategic analysis stage is the measurement of the business's internal resources. In fact, the resource portfolio is unique to each business and may become a source of differentiation. Consequently, an exhaustive knowledge of the resources available internally and within the territory is required. Collection of this information is undertaken through the bearer of the internal resources (internal stakeholders), their external interlocutors (i.e. suppliers, official authorities, professional network, etc.) and external "stakeholders without a voice" (i.e. the territory, the natural environment, the local population, etc.).

The second stage of our method, strategic choice, provides extra information to decision makers in order to assist them in their choice of strategy. The strategic options emerge from the method's first stage and embody the needs and expectations of the stakeholders. The authors propose the use of three criteria to rank these strategic options - "importance", "capacity" and "sustainability". "Importance" is applied to stakeholders considering that they don't have the same influence on the business. A review of the literature relating to different methods of classifying stakeholders is currently in progress. The capacity screen is the outcome of a comparison of resources available in the company (internal reservoir) or latent in the territory (territorial reservoir) and the resources required to implement the strategies adopted. The sustainability screen applied to the strategic options is based on three principles of environmental sustainability, three societal sustainability principles and an economic principle.

(Ambroise-Renaud, 2011) proposes a principle of economic and impact relocalization. (Holmberg et al., 2000) propose a framework for strategic planning that refers to environmental sustainability principles. "In order for a society to be sustainable, nature's functions and diversity are not systematically subject to increasing concentrations of substances extracted from the Earth's crust; subject to increasing concentrations of substances produced by society; impoverished by over-harvesting or other forms of ecosystem manipulation ». (Buclet, 2011) proposes abandoning current paradigms and adopting three principles of governance: capability, proximity and participatory democracy. "Proximity" aims to bring decision making closer to the level affected by the decision-making process. "Capability" seeks to respect and develop the capacity of individuals to satisfy their own expectations. "Participatory democracy" aims to establish a balance between individual preferences and collective interests in relation to sustainable development issues.

The third stage is the stage of implementing sustainable strategies. This is the stage during which the resources required to achieve the strategic objectives are allocated in accordance with roadmaps developed in conjunction with tactical plans. This stage is a part of the French national agency (ANR) convergence project (Zhang et al., 2013).

The fourth stage is the reporting on value co-creation oriented to the business's internal and external stakeholders. Intangible assets management can support this stage.

The proposal outlined here aims to provide designers with new resources that to date have been neglected or exploited to a limited extent only. However, these new resources need to be incorporated by each member of the line staff into their routine activities. The authors emphasize that although this is process managed on a top-down basis, it is in fact the designers, through their design choices, who may be the initiators of change in the use—or neglect—of these territorial resources.

4 CONCLUSIONS

As our success stories have shown, existing resources may be replaced by territorial resources at various stages in the product development process and that substitution may improve the global performance of the company-territory system. Connecting company's value creation network with territorial value network helps sustainability of the business. The territorial linkage is facilitated by interdependent association with the different territorial ecosystems. These associations increase the resilience of the territorial ecosystem, protecting local jobs and creating both tangible and intangible values for the territory.

At this stage of our research, we are unable to draw any conclusions concerning the environmental contribution of the inclusion of territorial resources in ecodesign processes or the economic value of this type of process. Nevertheless, we have been able to conclude that territorialization of the business's resources creates positive externalities for the territory and may result in substantial improvements in the business's value-creating components (e.g. brand capital, customer capital) and may turn into a differentiator for responsible companies.

In a near future a case study will be implemented to determine how these new resources actually influence the design process and the global quality of the product emerging from the design. We will validate our model by in-situ measurement of the improvements in global performance that businesses have achieved using this method.

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REFERENCES

- Allee, V. (2000) Reconfiguring the value network, *Journal of Business Strategy*, Vol. 21, No. 4, july-august.
- Ambroise-Renault, V. (2011) Indicateurs de développement soutenable dans le logement, thèse de doctorat,
- Angeon V. and Vollet D. (2008) Spécificité des produits et développement territorial. L'exemple paradoxal du panier de biens en émergence de l'Aubrac, *Revue d'Économie Régionale & Urbaine*, Vol.4, pp. 591-615.
- Azar, C., Holmberg, J. and Lindgren, K. (1996), Socio-ecological indicators for sustainability, *ecological economics*, Vol.18, pp. 89-112.
- Baret P. (2006), L'évaluation contingente de la performance globale des entreprises : une méthode pour fonder un management socialement responsable ?, *2ème journée de recherche du CEROS*, pp. 1-24.
- Boyle, I.M., Duffy, A.H.B., Whitfield, R.I. and Liu, S. (2009) Towards an understanding of the impact of resources on the design process. *17th International Conference on Engineering Design – ICED 2009*, Stanford, USA.
- Buclet N. (2011), Le territoire, entre liberté et durabilité, *Presses Universitaires de France*, ISBN : 978-2-13-057925-0.
- Charreaux, G., Desbrières, P., Corporate Governance: Stakeholder Value versus Shareholder Value, *Journal of Management and Governance*, Vol.5, No. 2, pp. 107-128.
- De Winter A. and Kals J.A.G. (1994), A Methodic Approach to the Environmental Effects of Manufacturing, *International Seminar on Life Cycle Engineering RECY'94*, Erlangen, Allemagne/ CIRP.
- Elkington, J. (1997), Cannibals with Forks: The Triple Bottom Line of 21st Century, *New Society Publishers*.
- Fustec A. et al (2011), Référentiel français de mesure de la valeur extra-financière et financière du capital immatériel des entreprises, *ministère de l'économie des finances et de l'industrie*.
- Holmberg, J., Robèrt, K-H. (2000) Backcasting from non-overlapping sustainability principles – a framework for strategic planning. *International Journal of Sustainable Development and World Ecology*, Vol. 7, pp. 291-308.
- Lorino, P. and Tarondeau J-C. (2006), De la stratégie aux processus stratégiques, *Revue française de gestion*, Vol.1, No. 160, pp. 307-328.
- Mercier-Laurent E. (2011), Les écosystèmes de l'innovation, *Lavoisier*, Number ISBN: 978-2-7462-2117-8.
- Moine, A. (2006), Le territoire comme un système complexe : un concept opératoire pour l'aménagement et la géographie, *L'Espace géographique*, Vol. 2, No. 35, pp. 115-132.
- Neely A. et Al. (2007), Business performance Measurment, *Cambridge University Press*, Number ISBN : 978-0-521-85511-2.
- Normann R. and Ramirez R, (1994), Designing Interactive Strategy: from value chain to value constellation, *John Wiley & sons*, Number ISBN 0-471-95086-6.
- Porritt, J. (2007), capitalism, as if the world matters, *earthscan*, Number ISBN : 978-1-84407-193-7.
- Roux, E., Vollet D. and Pecqueur, B. (2006) Coordinations d'acteurs et valorisation des ressources territoriales. Les cas de l'Aubrac et des Baronnie, *Économie rurale*
- Vaileanu Paun, I. (2010) Vers une territorialisation de la valeur des entreprises : les apports de l'économie de fonctionnalité, *colloque international « travail, capital et savoir dans la mondialisation*, Grenoble.
- Wheeler D., Colbert B. and Freeman R.E. (2003), Focusing on Value: Reconciling Corporate Social Responsibility, Sustainability and a Stakeholder Approach in a Network World, *Journal of General Management*, Vol. 28, No. 3.
- Zhang, F., Rio, M. and Allais, R. (to be published), toward a systemic navigation framework to integrate sustainable development into the company, *Journal of Cleaner Production*.