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Resources that drive performance: an empirical investigation

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Abstract

Purpose – To investigate in an empirical situation the resources that drive organizational performance, considering as resources HR practices, human competencies and other tangible resources and evaluating performance according to the balanced scorecard (BSC) model.

Design/methodology/approach – After literature review, a case study in a Brazilian water company was chosen. Methodology consisted of in-depth interviews with managers; collection of information from company's database and questionnaires; factor analysis to identify underlying factors that explain the majority of variance for each BSC perspective; regression analysis to find association between factors and resources.

Findings – In general, resources seemed to be correlated to performance, but further details appeared: employee competency presented no correlation with performance; environmental factors related to demand seemed to be the strongest performance determinant; employee satisfaction showed association with all BSC perspective.

Research limitations/implications – The research circumstances are quite particular and should not be generalized to other organizations. Future research should focus on more knowledge intensive firms and use a longitudinal research design.

Practical implications – The results for practitioners, especially those in the investigated company, included the need to review part of their indicators, choosing formulae that are better connected to business results.

Originality/value – This paper helps to understand how resources and competencies convert into performance and proposes a methodology to be used under particular conditions of organizations with multiple and comparable business units.

Keywords Performance measures, Balanced scorecard, Organizational performance, Brazil

Paper type Research paper



Literature review

Since, the article by Prahalad and Hamel (1990) core competences and organizational competence has been on the business agenda. However, there is often little emphasis on the origins of the competence discussion in the resource-based view of the firm (RBV), pioneered by Penrose (1959). According to that view, an organization consists of a set of resources employed in a productive way to generate wealth. Examples of resources

are the firm's buildings and equipment, the skills and competencies of its employees, procedures and norms, culture and values, etc.

The competence notion itself can be understood from the RBV. As Mills *et al.* (2002) put it, a competence results from a set of resources coordinated in a way that provides a particular level of performance in a firm. Mills *et al.* are not the only researchers that support the connection between competence and the RBV. To represent these interdependences and the coordination that results in organizational competence, the authors use a triangle to represent the boundary of a competence; ellipses to represent resources on which the competence depends; and arrows representing the coordination activities lying on the boundaries, as shown in Figure 1.

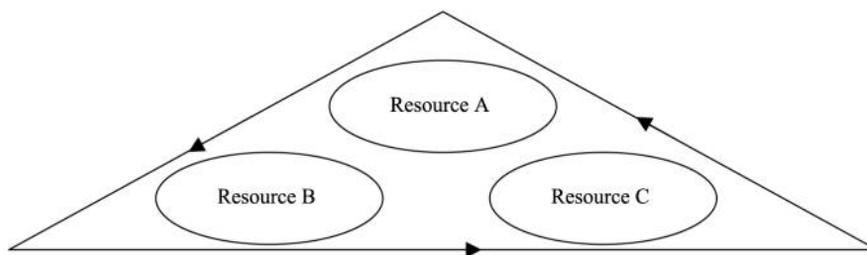
Using different words[1], other authors share the idea. For instance, Grant (1991, p. 120) suggests "the capabilities of a firm are what it can do as a result of teams of resources working together". In the same way, Sanchez (2001, p. 7) defines competences as "the ability of an organization to sustain coordinated deployments of assets and capabilities in ways that help the organization achieve its goals". Further, Hamel (1994, p. 11) affirms "a competence is a bundle of constituent skills and technologies, rather than a single, discrete skill or technology".

Another important idea implicit in this argument is that resources drive performance. The idea is not completely new. Drucker (1995), in arguing about the need for the adoption of other measures beyond financial, reminds us of the necessity of having information about competences. For Drucker, competences show the organizational capacity for wealth creating in the future.

Kaplan and Norton (1992), in their balanced scorecard (BSC) model, proposed the division of firm performance to four perspectives: financial, customer, internal process and innovation and learning. They put competences and resources in the fourth perspective, signaling they enable achievement of performance levels in other dimensions. To support this argument, they gave an example:

If we increase employee training about products, then they will become more knowledgeable about the full range of products they can sell; if employees are more knowledgeable about products, then their Sales effectiveness will improve. If their sales effectiveness improves, then the average margin of the products they sell will increase (Kaplan and Norton, 1996, p. 149).

These authors reinforced their argument in their book, *Strategy Maps* (2004), promoting the fourth perspective and its underlying resources (human, information and organizational capital)[2]. Here, Kaplan and Norton (2004) use the idea of intangible assets as the content of the learning and growth perspective.



Source: Mills *et al.* (2002)

Figure 1.
Competences and
resources

Marr and Adams (2004) stressed the importance of clarifying what is really meant by intangible assets and according to them, Kaplan and Norton (2004) is confusing since, they failed to review properly the large body of intangible assets literature. Despite this Marr and Adams support the role of intangible assets in driving performance.

Among the resources that drive performance, several authors emphasize human factors. As Becker and Gerhart (1996, pp. 781-2) said:

... according to the resource-based view of the firm, firms can develop sustained competitive advantage only by creating value in a way that is rare and difficult for competitors to imitate. Although traditional sources of competitive advantage such as natural resources, technology, economies of scale and so forth, create value, the resource-based argument is that these sources are increasingly easy to imitate, especially in comparison to a complex social structure such as an employment system. If that is so, human resource strategies may be an especially important source of sustained competitive advantage.

To test the contribution of human related resources to performance, several studies have been conducted recently. Mills and Fernandes (2004), in a review effort, classified them according to the BSC perspective that they covered and the research variable investigated. Table I summarizes that study. In Table I, resources correspond to the independent variables being analyzed and performance in several dimensions is the dependent variables. Table I also shows the indicators each study adopted under the performance perspective and the name of the firm in which the study was conducted. When no firm is mentioned, the study has used a survey. Though resources are classified under the innovation and learning perspective, this perspective is also presented as a dependent variable, as some of its indicators can result from former drivers, for instance, the impact of HR practices on labour turnover.

Though we acknowledge the BSC traditional four perspectives must be adapted to multiple stakeholder interests we decided to use the four dimensions as a framework, due to its wide use in the literature and the possibility to insert different research under those categories.

Analyzing these results, Mills and Fernandes (2004) noticed that most studies focus on financial and operational performance. Fewer studies covered the customer dimension or other indicators of the innovation perspective. Even fewer researchers tried to look simultaneously at all perspectives and, the ones that did (Delaney and Hesselid, 1996) are based on perceptual firm performance measures.

The great majority of the studies concentrate on HR procedures as resources, with fewer researchers looking at other human-related resources like skills or human capital. One reason for this can be the fact that each business has different resources as drivers. For instance, high staff turnover rates can be a healthy indicator in a fast food chain, but would be a disaster in an R&D department. As a consequence, the studies that looked over different resources segmented their sample to specific sectors or even to a single firm, like Rucci *et al.* (1998) in Sears department store or Barber *et al.*'s (1999) research on UK retail stores.

On the other hand, every company has HR practices, which make them more "comparable" under this term. But studies considering the impact of this dimension alone on performance have found weak or no association at all between HR practices and performance (Mueller, 1996; Becker and Gerhart, 1996; Farias and Varma, 1998). This may indicate the need to consider other resources together with HR practices when studying that relationship.

Resources	Number of studies/examples			Learning
	Financial	Customer	Internal process	
HR practices and procedures (e.g. structured recruitment and selection, intensive training, higher pays)	12 Lawler <i>et al.</i> (1995): financial performance Husselid (1995, 1997): profit; firm market value Delaney and Husselid (1996): sales growth	3 Banker <i>et al.</i> (1996): customer satisfaction Delaney and Husselid (1996): market share, customer satisfaction Bae and Lawler (2000): image	10 Arthur (1994): efficiency, waste Husselid (1995, 1997): productivity (sales/employee) Delaney and Husselid (1996): quality; product innovation	7 Arthur (1994): turnover Husselid (1995, 1997): turnover Delaney and Husselid (1996): employee skills Youndt <i>et al.</i> (n.d.): moral
Turnover	1 Batt (2002): sales growth	1 Schay <i>et al.</i> (2002): citizen satisfaction	2 Becker <i>et al.</i> (2001): product innovation [GTE] Schay <i>et al.</i> (2002): lead time	
Employees motivation (satisfaction, strategy knowledge)	6 Rucci <i>et al.</i> (1998): sales turnover growth [Sears] Barber <i>et al.</i> (1999): sales turnover Kaplan and Norton (2001): ROI [Mobil; Store 24]	6 Rucci <i>et al.</i> (1998): customer satisfaction [Sears] Barber <i>et al.</i> (1999): customer satisfaction and loyalty Schay <i>et al.</i> (2002): citizen satisfaction	3 Varma <i>et al.</i> (1999): speed, productivity Schay <i>et al.</i> (2002): lead time Kaplan and Norton (2001): strategy knowledge, motivation; lead time [Mobil; Store 24]	
Human capital skills	1 Batt (2002): sales growth Kaplan and Norton (2004): sales turnover, ROI [Northwestern Mutual, Volvo Finans, etc.]	1 Schay <i>et al.</i> (2002): citizen satisfaction Kaplan and Norton (2004): customer satisfaction, brand strength, new products [Northwestern Mutual, Volvo Finans, etc.]	2 Hitt <i>et al.</i> (2001): human capital, sales turnover/employee Schay <i>et al.</i> (2002): lead time Kaplan and Norton (2004): project management, technological support, quality [Northwestern Mutual, Volvo Finans, etc.]	1 Gales <i>et al.</i> (2002): technology and management use*
Total	21	12	18	8

Source: Mills and Fernandes (2004)

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Table I.
Empirical studies on the
association between
organizational resources
and performance

Another problem related to finding other resource drivers of performance concerns the difficulties met in operationalizing these concepts. For instance, some researchers have tried to include competency indicators, but they could not make them operational, like Kaplan and Norton (2001) when they described the Mobil and Store 24 cases cited in Table I, or Schay *et al.* (2002) in the American government BSC implementation.

Finally, though Kaplan and Norton (2004) report several cases, they do not go into further detail; the cases are presented in a rather generic way and hard data are scarcely provided. As a consequence, this book does not shed much light over the debate discussed here.

These observations point to the need to conceive studies that evaluate performance over multiple perspectives simultaneously and include more indicators than just HR practices.

Methodology

The present study's research question is what are the resources that drive organization performance in a given situation, considering other indicators beyond HR practices and involving all performance perspectives of the BSC model? The empirical research described in this paper tried to address these issues. To do so a case study in a Brazilian water company was chosen. The following methodological steps were used:

- (1) In-depth interviews and workshops with a group of eight managers in the company, to design the resources and competences architecture using Mills *et al.* (2002) methodology and to draw the perceived causal maps linking performance indicators with resource drivers.
- (2) Collection of relevant information from the company's database and questionnaires, for information not available in the system.
- (3) Factor analysis to identify underlying factors that explain the majority of variance according to each performance dimension.
- (4) Regression analysis to find association between factors and resources in different performance perspectives.

Study in a Brazilian water company

Sanepar is a Brazilian water company created in 1963 to provide water and sewage treatment in Paraná State. In 2002, its turnover was US\$ 310 millions. It has around 4,000 employees.

Since 1997, its organizational structure has consisted of two levels: a holding company at the corporate level and business units (BUs) at the operational level. The corporate level is responsible for centralized decisions like the investment process, long range strategic planning and corporate R&D. The BUs are of two types: service business units, whose role is to offer services in an internal market to other BUs; and sales BUs, responsible for dealing with external customers. Service BUs include personnel, maintenance, accounting, engineering projects, etc. and they make their turnover through a system of internal transfer pricing. The company has 93 BUs, 38 of them are of the sales type.

The company's management system was inspired by the BSC, though they do not follow this model rigorously. In the beginning of the annual planning cycle, the BU's agree their targets with centralized strategic planning. For each perspective, financial,

customer, internal process and learning, they have performance indicators, which must be filled in as targets. During this target setting process, the BU managers have to deal with their supplier business units to define feasible numbers. After that, they have to negotiate with the corporate level. The results of these discussions are the targets BUs have to accomplish in the following year. Individual bonus payments are linked to the achievement of these targets. Table II illustrates some indicators adopted by the company for sales BUs, according to the BSC perspective. It is worth mentioning that these indicators are adopted by all sales BUs and are used to identify and disseminate best performance.

The four perspectives model was adopted here in order to have comparability with the literature review framework used, despite the fact that another classification emphasizing stakeholders, like regulator authorities and communities, could be better.

The management system is monitored with SGS software, which stores all the BU indicators. In 2002, this software was awarded by Microsoft for the best Solution in Business Intelligence in Latin America (SANARE, 2002, p. 3). For this business model to work, one organizational competence is essential: achieve targets. So, using the model proposed by Mills *et al.* (2002), through workshops with managers, their perception of the resources necessary for realizing this competence were listed. The work referred specifically to the sales BUs. Table III shows the analyses.

The management group then created a causal map that linked these resources to performance dimensions. Figure 2 shows part of this map. The methodology used consisted of: listing relevant variables in each perspective for their performance;

Perspective	Indicators	Source
Financial	Net results	BU's profit
	EBITDA	Earnings before interests, taxes, depreciation and amortization.
	Operational sales turnover	Sum of sales turnover from products and sales turnover from services
Customer	BU expenses	Expenses with personnel, administrative, etc.
	Customer satisfaction	Customer satisfaction survey.
	Total complaint	Sum of all complaints received by the company.
	Water attendance	Coverage level with water provision
Internal process	Sewage attendance	Coverage level with sewage collection
	Water produced volume	BU water connection number
	Sewage collected volume	BU sewage connection number
	Productivity	BU number of water and sewage connection per employee
	Water provision interruption	Number of hours without water supply
	Sewage reflux	Number of reflux for each 1000 sewage connection
Learning	Pave replacement	Percentage of pave replacement with execution superior to 10 days
	Employee training	Hours/year quantity
	Employee satisfaction	Moral survey
	Employee competencies	Competency assessment by company competency management system.
	Assets	Value in currency of the BU assets

Source: SANARE (2002)

Table II.
Some company
performance indicators

Resources	Competence resources decomposition	What was measured/assessed	How was measured/assessed
Tangible resources	BU's automation level Material resources (administrative infra-structure and computer network)	BU's automation level Net asset; # water connection, # sewage connection, # water residential economy	Questionnaire (0-14 scale) PIS (currency; quantity)
Skills, knowledge and experience	Manager individual competency (results and strategy orientation, etc.) team's competencies (results orientation, teamwork, etc.) team's moral Job knowledge and experience	Manager individual competency (results and strategy orientation, etc.) Team's competencies (results orientation, teamwork, etc.); Productivity; extra hours work Employee's satisfaction; # work accidents Team's background, experience and training; complexity level	CAS (0-20 scale) CAS (0-20 scale) PIS (qt connections; qt hours) PIS (0-10 scale; quantity) CAS (0-20 scale); PIS (no. of employees > 20 h train); CAS (complexity level index)
Procedures and systems	Strategic control system Payment system (bonus) Quality systems (ISO 9000, 14000)	Not being measured/assessed	Common in all company SBU's
Values and culture	Results driven Customer driven (internal/external)	Not being directly measured/assessed	Assessed through the competencies and indicators
Network	Manager's and team's knowledge level of the company and business	Team's customer orientation competency Manager's leadership, customer orientation and environment interaction competency	CAS (0-20 scale)

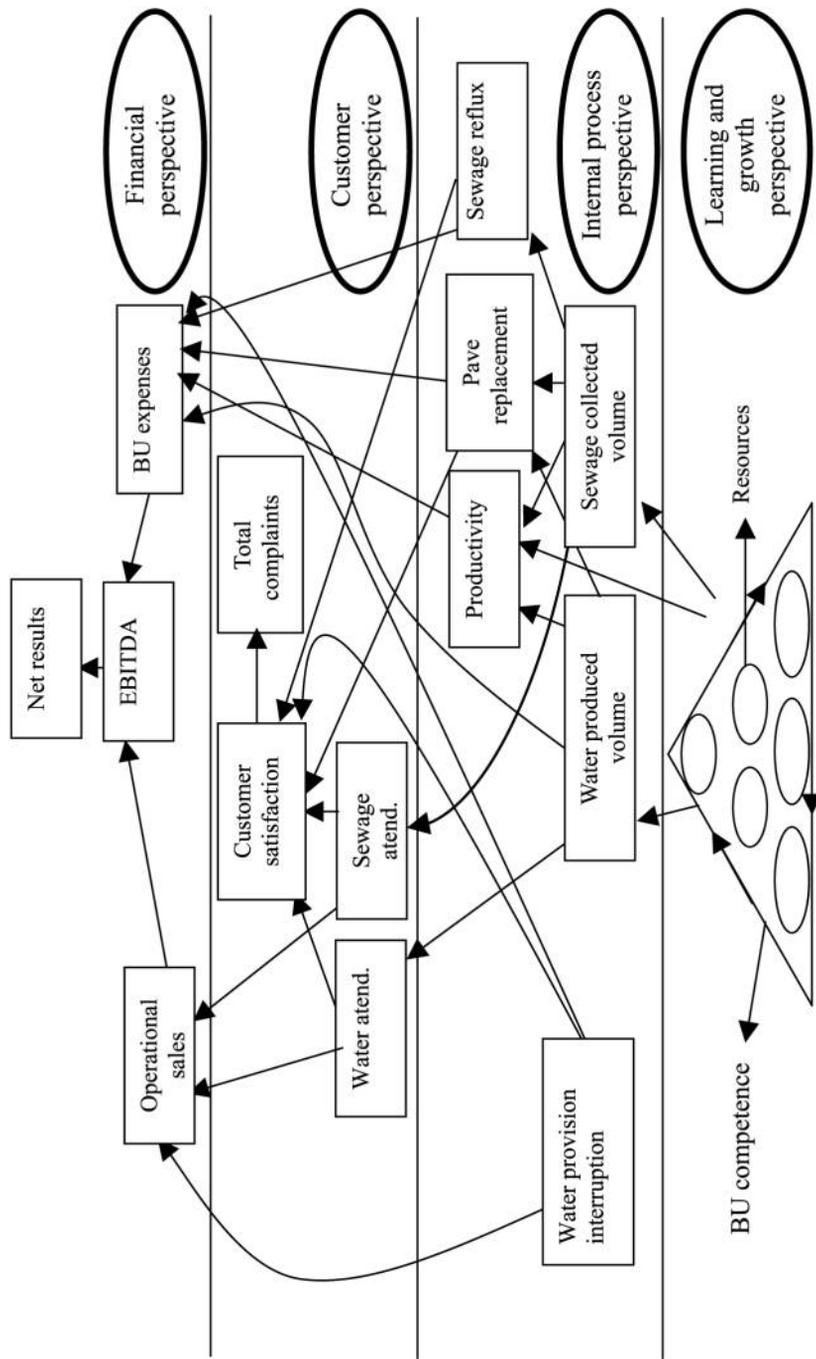
Table III.
Resources and resources measurement

Notes: PIS – performance indicator system; CAS – competency assessment system
Source: Authors

drawing causal connections among variables. Following Mills *et al.* (2002), the triangle in the basis represents the boundary of the BU competence; the circles inside represent the resources on which this competence depends; the arrows represent the configuration and co-ordination of the resources that produces the performance level of the competence. Each variable is explained in Table IV. Following our previous note, the competence is taken as a proxy for learning and growth perspective.

Data analysis

The model proposed by the group was hugely complex for testing under an empirical investigation. So, the next step of the study consisted of factor analyzing the variables (indicators) under each BSC perspective in order to find underlying factors that could explain the majority of the variance. As it is shown in Table V, some factors were considered for further analysis and other factors refused. As a rule for acceptance of a



Source: Workshops

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Figure 2.
Cognitive causal map of
the firm

Perspective	Indicators	Source
Financial	Net results	BU's profit
	EBITDA	Earnings before interests, taxes, depreciation and amortization.
Customer	Operational sales turnover	Sum of sales turnover from products and sales turnover from services
	BU expenses	Expenses with personnel, administrative, etc.
	Customer satisfaction	Customer satisfaction survey.
	Total complaint	Sum of all complaints received by the company
	Water attendance	Coverage level with water provision
Internal process	Sewage attendance	Coverage level with sewage collection
	Water produced volume	BU water connection number
	Sewage collected volume	BU sewage connection number
	Productivity	BU number of water and sewage connection per employee
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Learning	Sewage reflux	Number of reflux for each 1000 sewage connection
	Pave replacement	Percentage of pave replacement with execution superior to 10 days
	Employee training	Hours/year quantity
	Employee satisfaction	Moral survey
	Employee competencies	Competency assessment by company competency management system.
	Assets	Value in currency of the BU assets

Table IV.
Variable explanation

Source: SANARE (2002)

factor, it was defined that KMO (Kaiser-Meyer-Olkin sample adequacy measures) should be greater than 0.7. Further, for each BSC perspective, it was taken only the factor with the greatest explained variance. So, in the financial perspective the factors considered were sales turnover and expenses, grouping the variables operational revenue, UR expenses and administrative expenses. For customer perspective, it was chosen customer satisfaction, taken as a single variable because the factor that grouped customer satisfaction and total complaints presented $KMO < 0.7$. For internal process perspective the factor was water target, grouping the variables water production and distribution measured volume. In the learning and growth perspective all factors were considered because they are meaningful for the research question. The reduced variables are resources density, grouping employee number; overtime number and assets per connection; employee satisfaction, including the automation level index and the employee satisfaction original variable (with inverse signals, suggesting that the greater the automation, the less satisfied the workers); competency, representing an average of the BU workforce competency.

A control variable was later added to the model: achievement of demand predictions. This was included because the model assumes that the predictions made during the planning process will occur. If they do not, the performance can be strongly affected by a reason not related to competence or resource. A new map was drawn with the reduced and control variables. Figure 3 illustrates the association.

To summarize, the model proposes that the variables in the lower group affect the target related to water provision. These goals, if achieved, will affect customer

Perspective	Initial var. n.	Factor	Explained variance (percent)	Acceptance	Observation
Financial	7	Sales turnover and expenses	65.2	Yes	
		Net financial indicators	22.6	No	Worse explained variance
Customer	2	Customer satisfaction	67.9	No	KMO < 0.7 Use only of the customer satisfaction variable
Internal process	6	Water target	60.0	Yes	
		Sewage target	24.0	No	Worse explained variance
	6	System loss	48.2	No	KMO < 0.7
		Repair	21.3	No	
Learning and growth	7	Water provision interruption	17.7	No	
		Resource density	55.9	Yes	
	9	Employee satisfaction	20.9	Yes	
Competency		62.8	Yes		

Table V.
Summary of the variables
in the model after the
factorial analysis

Source: Authors

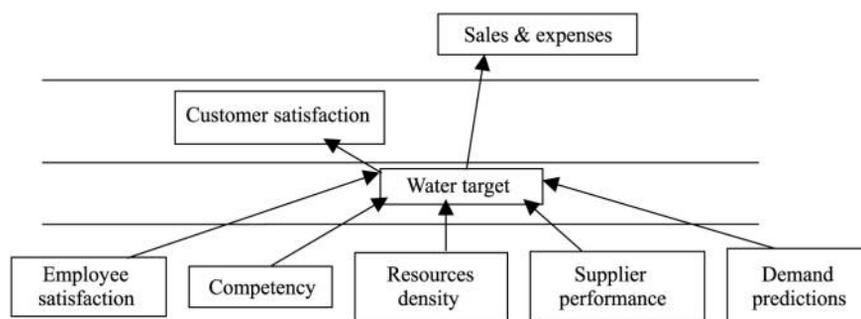


Figure 3.
Tested model (Authors)

satisfaction and will allow the achievement of sales turnover and expense goals. The regression analysis aimed to check these associations.

The regression analysis conducted for pairs of variables when the association was theoretical meaningful is presented in Table VI.

The results show no relationship between employee competencies and supplier performance with BU performance ($p > 0.05$). Resource density was associated with internal process and financial target achievements, but not with customer

Dependent Variable	Independent variable	Water target (internal process perspective)	Customer satisfaction (customer perspective)	Sales and expenses (financial perspective)
Competency	$R^2_{adjusted}$	-0.017	-0.014	-0.027
	p -value	0.538	0.492	0.907
Sup. Perform	$R^2_{adjusted}$	0.021	-0.026	-0.013
	p -value	0.189	0.822	0.472
Res. Density	$R^2_{adjusted}$	0.110*	-0.015	0.104*
	p -value	0.023	0.510	0.027
Demand pred	$R^2_{adjusted}$	0.620*	0.59	0.405*
	p -value	0.000	0.077	0.000
Empl. Satisf.	$R^2_{adjusted}$	0.405*	0.227*	0.090*
	p -value	0.000	0.001	0.037
Water target	$R^2_{adjusted}$		0.232*	0.377*
	p -value		0.001	0.000

Table VI.
Regression analysis of model associations

Note: *Acceptable association (p -value < 0.05)
Source: Authors

perspective. Demand prediction achievement revealed the strongest effect over the internal process and the financial targets. The employee satisfaction variable showed significant links with the three performance perspectives. Further, achieving water targets is also associated to better customer satisfaction and achieving financial goals.

In order to understand better the impact of employee satisfaction on firm performance, the procedures proposed by other authors (Husselid *et al.*, 1997; Gales *et al.*, 2002) were used. A simulation of what would happen with an increase of one standard deviation in the employee satisfaction reduced variable was conducted. That increment in the original variable represents a 6 percent increase. Table VII shows the results.

The results point to the fact that employee satisfaction seems to guide significantly the BU to achieve its goals. Once the goals are achieved, a slight increase in the customer satisfaction is observed and this affects the BU sales and expenses targets.

The result confirms previous work done in this area showing how employee satisfaction affects performance (Rucci *et al.*, 1998; Barber *et al.*, 1999; Neely and Najar, 2003). It is interesting to note how the other studies, done in similar industries, present similar relationships between employee and customer satisfaction, whilst the present study shows a different one (Table VIII).

Table VII.
Impact of employee satisfaction increase over performance indicators

Increase in employee satisfaction (percent)	Water targets (percent)	Increase in Customer satisfaction (percent)	Sales and expenses (percent)
6.0	1.2	0.45	3.0

Source: Authors

Conclusion

This paper defines the competence concept as a set of coordinated resources that achieve a certain level of performance. However, a study review in this field using the BSC model to organize performance dimensions revealed that few studies evaluate how different resources (not only HR practices) can impact all performance perspectives simultaneously.

The present paper addressed this question in a Brazilian water company, trying to investigate how different resources were associated to performance in different levels.

In general, resources seemed to be correlated to performance, but further details appeared in the analyses:

- Employee competency level, evaluated through a competency assessment system adopted by the firm presented no correlation with performance.
- Environmental factors related to the demand seemed to be the strongest performance determinant (and the competence to predict them may be an essential one in this business).
- Employee satisfaction showed an association with internal process, financial targets and customer satisfaction, though with weaker impact on customer satisfaction than revealed by studies conducted in the service and retail sector.

The first result is curious. It suggests that the personal development level does not count in that company. Possible explanations are:

- People can be competent, but if they are not coordinated properly this will not be converted to organizational performance. A proxy for coordination could have been managers' competencies but, in this research, it was not possible to assess manager competency separately from their team's competencies. So it was not possible to assess the coordination level.
- In this research, the BUs tested were very operational dealing with billing, customer queries and resources like norms and procedures seemed to be the main coordination mechanisms. In such an environment, to follow procedures can be more important than high human competency.

These results also reinforce the resource-based view argument, showing an empirical situation in which organizations in similar conditions with comparable

Increase in employee satisfaction (percent)	Increase in customer satisfaction (percent)	Firm/industry	Authors
5	1.30	Sears/retail – US	Rucci <i>et al.</i> (1998)
1	0.23	Retail – England	Barber <i>et al.</i> (1999)
1	0.25	Service firm – England	Neely and Najjar (2003)
6	0.45	Water company – Brazil	Present study

Source: Authors

Table VIII.
Relationship between
employee and customer
satisfaction

resources perform very differently according to the way they coordinate their resources.

This paper also proposes a methodology to evaluate the link between resource and performance to be used in particular conditions. This methodology consists of: managers drawing causal maps representing links among relevant performance indicators; applying factor analysis to reduce the number of variables and shed light on underlying factors; redrawing the causal map with the new variables; testing the new proposed links with regression models. It is worth saying that, according to the number of cases, it is possible to use techniques such as structural equation modeling to explore not only correlation, but causal relations among variables.

Future research in this field should focus on more knowledge intensive firms, in which it is possible that human competencies be more relevant. In this research, the sample consisted of BUs working on very operational tasks.

Future studies should also focus on longitudinal research design, especially when dealing with competencies that are more likely to show their effects in the long run, not in the short period of time that characterized this research.

The results for practitioners, especially those in the investigated company, included the need to review part of their indicators, choosing formulae that are better connected to business results. For instance, indicators used for training – number of people with more than 20 hours of training per year – showed weak correlation with performance. Another contribution is to develop multivariate demand prediction modeling, as it seems to be a key success factor in this business.

Notes

1. Foss (1997) points to the lack of universal definitions in the RBV: “Most conspicuously, there is a considerable amount of terminological soup, with various resource-based theorists using concepts such as ‘resources’, ‘competences’, ‘capabilities’, ‘assets’, etc. for what is often essentially the same thing(s)” (p. 346).
2. This paper considers organizational competence as a bundle of resources in a general way. As the learning and growth perspective may be considered a set of coordinated resources, regardless the name used to call them (human, information and organizational capital in Kaplan and Norton’s view, or human, structural and customer capital (Stewart, 1997) or even external/internal structure and individual competence (Sveiby, 1997), this paper considers the learning and growth perspective and organizational concept as very close concepts.

References

- Arthur, J. (1994), “Effects of human resource systems on manufacturing performance and turnover”, *Academy of Management Journal*, Vol. 37 No. 3, pp. 670-87.
- Bae, J. and Lawler, J.J. (2000), “Organizational and HRM strategies in Korea: impact on firm performance in an emerging economy”, *Academy of Management Journal*, Vol. 43 No. 3, pp. 502-17.
- Banker, R.D., Lee, S.Y., Potter, G. and Srinivasan, D. (1996), “Contextual analysis of performance impacts of outcome-based incentive compensation”, *Academy of Management Journal*, Vol. 39 No. 4, pp. 920-48.
- Barber, L., Hayday, S. and Bevan, S. (1999), “From people to profits”, Report 355, The Institute for Employment Studies, Brighton.

- Batt, R. (2002), "Managing customer services: human resource practices, quit rates and sales growth", *Academy of Management Journal*, Vol. 45 No. 3, pp. 587-97.
- Becker, B.E. and Gerhart, B. (1996), "The impact of human resources management on organizational performance: progress and prospects", *Academy of Management Journal*, Vol. 39 No. 4, pp. 779-801.
- Becker, B.E., Huselid, M.A. and Ulrich, D. (2001), *The HR Scorecard: Linking People, Strategy and Performance*, Harvard Business School Press, Boston, MA.
- Delaney, J. and Huselid, M. (1996), "The impact of human resources management practices on perceptions of organizational performance", *Academy of Management Journal*, Vol. 39 No. 4, pp. 949-69.
- Drucker, P.F. (1995), "The information executives truly need", *Harvard Business Review*, Vol. 73 No. 1, pp. 54-62.
- Farias, G. and Varma, A. (1998), "High performance work systems: what we know and what we need to know", *Human Resource Planning*, Vol. 21 No. 2, pp. 50-5.
- Foss, N.J. (1997), *Resources, Firms and Strategies: A Reader in the Resource-based Perspective*, Oxford University Press, Oxford.
- Gales, H.F., Wojan, T.R. and Olmsted, J.C. (2002), "Skills, flexible manufacturing technology and work organization", *Industrial Relations*, Vol. 41 No. 1, pp. 48-79.
- Grant, R.M. (1991), "The resource-based theory of competitive advantage: implication for strategy formulation", *California Management Review*, Vol. 33 No. 3, pp. 114-35.
- Hamel, G. (1994), "The concept of core competence", in Hamel, G. and Heene, A. (Eds), *Competence Based Competition*, Wiley, Chichester, pp. 11-34.
- Hitt, M., Bierman, L., Shimizu, K. and Kochhar, R. (2001), "Direct and moderating effects of human capital on strategy and performance in professional service firms: a resource-based perspective", *Academy of Management Journal*, Vol. 44 No. 1, pp. 13-28.
- Huselid, M. (1995), "Impact of human resource management on turnover, productivity and corporate financial performance", *Academy of Management Journal*, Vol. 38 No. 3, pp. 635-72.
- Huselid, M.A., Jackson, S.E. and Schuler, R.S. (1997), "Technical and strategic human resource management effectiveness as determinants of firm performance", *Academy of Management Journal*, Vol. 40 No. 1, pp. 171-88.
- Kaplan, R. and Norton, D. (1992), "The balanced scorecard – measures that drive performance", *Harvard Business Review*, Vol. 70 No. 1, pp. 71-9.
- Kaplan, R. and Norton, D. (1996), *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business School Press, Boston, MA.
- Kaplan, R. and Norton, D. (2001), *The Strategy Focused Organization: How Balanced Scorecards Companies Thrive in the New Business Environment*, Harvard Business School Press, Boston, MA.
- Kaplan, R. and Norton, D. (2004), *Strategy Maps*, Harvard Business School Publishing Corporation, Boston, MA.
- Lawler, E.E., Mohman, S. and Ledford, G. (1995), *Creating High Performance Organizations*, Jossey-Bass, San Francisco, CA.
- Marr, B. and Adams, C. (2004), "The balanced scorecard and intangible assets: similar ideas, unaligned concepts", *Measuring Business Excellence*, Vol. 8 No. 3, pp. 18-27.
- Mills, J. and Fernandes, B.H. (2004), "Linking resources and organizational performance: replicated research designs, a case and a warning", in Neely, A. and Waters, A. (Eds),

Proceedings of the Performance Measurement Association Conference, Cranfield University, Cranfield, pp. 715-22.

- Mills, J., Platts, K., Bourne, M. and Richards, H. (2002), *Competing through competences*, Cambridge University Press, Cambridge.
- Mueller, F. (1996), "Human resource as strategic assets: an evolutionary resource-based theory", *Journal of Management Studies*, Vol. 33 No. 6, pp. 757-85.
- Neely, A. and Najjar, M. (2003), "Linking financial performance to employee and customer satisfaction", in Neely, A. (Ed.), *Business Performance Measurement: Theory and Practice*, Cambridge University Press, Cambridge, pp. 295-303.
- Penrose, E.T. (1959), *The Theory of Growth of the Firm*, Basil Blackwell, London.
- Prahalad, C.K. and Hamel, G. (1990), "The core competences of the corporation", *Harvard Business Review*, Vol. 68 No. 3, pp. 79-91.
- Rucci, A.J., Kim, S.P. and Quinn, R.T. (1998), "The employee-customer-profit chain at sears", *Harvard Business Review*, Vol. 76 No. 1, pp. 83-97.
- SANARE – *Revista Técnica da Sanepar* (2002), Vol. 18 No. 18, July-December, available at: www.sanepar.com.br/publicações/sanare/.
- Sanchez, R. (2001), "Managing knowledge into competence: the five learning cycles of the competent organization", in Sanchez, R. (Ed.), *Knowledge Management and Organizational Competence*, Oxford University Press, Oxford, pp. 3-37.
- Schay, B.W., Beach, M.E., Cadwell, J.A. and Lapolice, C. (2002), "Using standardized outcome measures in the federal government", *Human Resource Management*, Vol. 41 No. 3, pp. 355-68.
- Stewart, T.A. (1997), *Intellectual Capital: The New Wealth of Organizations*, Doubleday/Currency, New York, NY.
- Sveiby, K.E. (1997), *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*, Barrett-Kohler, San Francisco, CA.
- Varma, A., Beatty, R.W., Schneider, C.E. and Ulrich, D. (1999), "High performance work systems: exciting discovery or passing fad?", *Human Resource Planning*, Vol. 22 No. 1, pp. 26-37.
- Youndt, M.A., Snell, S.A., Dean, J.W. and Lepak, D.P. (n.d.), "Human resource management, manufacturing strategy and firm performance", *Academy of Management Journal*, Vol. 39 No. 4, pp. 836-66.

Further reading

- Barney, J.B. (1996), *Gaining and Sustaining Competitive Advantage*, Addison-Wesley, New York, NY.
- Pfeffer, J. (1995), *Competitive Advantage Through People: Unleashing the Power of the Work Force*, Harvard Business School Press, Boston, MA.

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