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PEOPLE FIRST! INTELLECTUAL CAPITAL AND GROWTH OF HIGH-GROWTH SOCIAL COOPERATIVES (SOCIAL GAZELLES) IN THE STARTUP STAGE. EVIDENCE FROM ITALY

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Abstract

Purpose. *This paper aims to investigate the relationship between Intellectual Capital (IC) and the revenues in high-growth social cooperatives in the startup phase (social gazelles).*
Design/methodology/approach. *Using the OECD definition, we have selected all 85 social cooperatives born in Italy in 2014 that became gazelles in 2018 or 2019. Applying the VAIC model, we measured the IC of these companies. Then we performed a panel regression analysis with fixed-effects specification to test our hypotheses regarding the effect exerted by the efficiency of human capital, structural capital and capital employed on the revenues of social gazelles.*
Findings. *The empirical analysis revealed that both Human Capital Efficiency (HCE) and Capital Employed Efficiency (CEE) have a positive effect on revenues of the Italian social gazelles. On the other side, we found a negative relationship between Structural Capital Efficiency (SCE) and the revenues of these companies.*
Practical and Social implications. *From a theoretical point of view, this paper contributes to the literature on high-growth firms (HGFs) shedding light on a topic still little explored. It also highlighted possible future lines of research. From a practical point of view, examining the relationship between IC and revenues of social gazelles, this study provides useful insights to design social startups.*
Originality of the study. *This paper fills a gap in the literature by highlighting the positive role of human capital efficiency (HCE) and capital employed efficiency (CEE) in the revenue of social gazelles.*

1. Introduction

Social cooperatives are the most important type of social enterprise (Thomas, 2004; Defourny & Nyssens, 2008; Euricse, 2011) and play a key role in the context of nonprofit organizations (Borzaga et al., 2014).

In Italy they are regulated by law no. 381/1991 and legislative decree no. 112/2017, which introduced two types of social cooperatives: type A and type B. While the former provides services to people, the latter employs disadvantaged workers.

Some of these social cooperatives achieve a sustained competitive advantage already in the startup stage. By satisfying widespread social needs, some of them achieve high revenues immediately after their birth and grow so much that they take on the characteristics of "gazelles", as young high-growth companies are called. The similarities with these gazelle companies lead us to call them "social gazelles", since they pursue purposes of a social nature.

We analyze accounting data of these social gazelles acquired from Aida-Bureau van Dijk digital database, in order to verify if the Intellectual Capital (IC) affects their revenue growth. For this purpose, we measured IC and its components, Human Capital (HC) and Structural Capital (SC) according to the Value-Added Intellectual Coefficient (VAIC) model (Pulic, 2000). Then we measured the efficiency of these components of the IC, i.e. the Human Capital Efficiency (HCE) and the Structural Capital Efficiency (SCE), which measure, respectively, the contribution of HC and SC to value added creation. Finally, we tested the relationship between the revenues of these social gazelles and the efficiency of the components of Pulic's VAIC model by carrying out a panel regression analysis with fixed-effects on a longitudinal dataset of 85 Italian social gazelles born in Italy in 2014.

This paper is structured as follows. Section 2 deals with the literature review. Section 3 presents the theoretical background and the hypotheses. Section 4 describes the research design, econometric analysis, and the results. Finally, sections 5 and 6 discuss the results and conclusions.

2. Literature review

Studies on high-growth firms (HGFs) began in the middle of the last century with the work of Edith Penrose (1959), "*Theory of the Growth of the Firm*". The ability of these companies to create a large share of net new jobs (Birch, 1981; 1987; Henrekson and Johansson, 2010) has captured the interest of scholars and policymakers.

While in the literature there is a large stream of studies that analyzed the relationship between IC, performance (e.g., Clarke, Seng, & Whiting, 2011;

Inkinen, 2015; Xu & Liu, 2020) and business growth (e.g., Mukherjee & Sen, 2019), there are no studies with specific reference to young high-growth social cooperatives. For instance, Pena (2002) has analyzed the impact of IC on the survival and success of startups. Temouri et al. (2020) analyzed how cluster location and IC impact the entrepreneurial success of the high-growth firms. Studies on young social HGFs are lacking. This is the contribution of our work to literature.

The use of the term "gazelle" refers only to young enterprises in the first stage of life is increasingly widespread among scholars (Kirchhoff, 1994; Brüderl & Preisendörfer, 2000; Fritsch & Weyh, 2006; Petersen & Ahmad, 2007; Acs & Mueller, 2008; Daunfeldt et al. 2015; Eklund & van Criekingen, 2022). Even the OECD uses the term gazelles in this meaning, since it defines them as "...all enterprises up to five years with an average annual growth of more than twenty per cent per year over three years and with ten or more employees at the beginning of the observation period" (Eurostat-OECD, 2007). The assimilation of the concept of a fast-growing company to startups is also widespread in practice. Paul Graham, co-founder of "Y Combinator", one of the most tech startup accelerators of the world, defines startups as companies "*designed to grow fast*" (Graham, 2012).

In this study, therefore, we consider gazelles only the high-growth startups. This meaning is becoming more and more widespread in the literature (Daunfeldt et al., 2015), in practice, and in the statistical international surveys on entrepreneurship carried out by the OECD. Therefore, by adopting the concept of gazelle in this meaning of a young, high-growth enterprise, it is possible to compare the results of this study with those of other scholars and statistical surveys, avoiding ambiguities deriving from the use of different notions of a gazelle firm (Petersen & Ahmad, 2007).

The existence of social gazelles indirectly testify that it is possible to successfully combine social value creation with financial sustainability of these social high-growth young firms.

Financial indicators (e.g., income, Return On Equity, Return On Sales, etc.) cannot be used to assess the performance of social cooperative gazelles. A debate on financial indicators that may be significant for social enterprises is still ongoing in the literature (Marin-Sanchez & Melia-Martì, 2006; López-Espinosa et al., 2009; Beaubien, 2011; Beaubien & Rixon, 2012). The creation of economic value in social enterprises is necessary for financial sustainability and business continuity (Dees, 1998; Mair & Martì, 2006). These nonprofit organizations rather they must create social value (Waligóra, 2019) by satisfying widespread social needs. They pursue their goals also exploiting social innovations (Campopiano & Bassani, 2021) and operating in networks with other social enterprises (Metallo et al., 2016).

Even though social cooperatives cannot pursue profit, revenue growth is consistent with their social mission (Carini & Costa, 2013). Therefore, in this

study we assume revenue growth as a proxy for achieving a sustained competitive advantage and, thus, the social value created by these firms (Andreaus, 1996; Thomas, 2004; Mancino & Thomas, 2005; Carini & Costa, 2013).

3. Theoretical framework and hypothesis

Stewart (1997) defines IC as knowledge, information, intellectual properties, and experiences that can generate wealth for the firm. Intellectual capital is the ability of the organizations to create intangible assets to generate value. We can observe it from two points of view: a static one, as a stock of knowledge, and a dynamic one, since the variation over time of this stock derives from the interactions between the members of the organizations (Kianto, 2007). According to Edvinsson & Malone (1997) IC includes the experience and skills gained by employees and customer relations.

IC is composed of the following three fundamental elements: 1) human capital (HC), consisting of the skills, experiences, and motivations of employees (Bontis, 1998; Stewart, 1997); 2) structural capital (SC), which is knowledge stored in databases and information systems of companies (Wu, Lin & Hsu, 2007); 3) relational capital, which is the knowledge developed in network relationships with other firms, people, and institutions (Nahapiet & Ghoshal, 1998).

ICM Group study (1998) indicates the following indicators for measuring IC components:

- SC: Administrative expense/total revenues, Processing time, out payments, Computers/employees, Contracts filed without error, corporate quality performance, Investment in IT.

- HC: Average years of service with the company, Number of employees, Number of managers, Revenues/employee, Employee turnover, Number of female managers. Profits/employee, Average age of employees, Number of exempt full-time employees, Average age of full-time exempt employees, Percent of company managers with advanced degrees.

Roos et al. (1998) proposed the following metrics for the intellectual capital elements:

- HC (competence, attitude, intellectual agility): Percent of employees with advanced degrees, IT literacy, Hours of training/employee, Average duration of employment, Hours spent in debriefing, Hours spent by senior staff explaining strategy and actions (overlap expertise) Leadership index. Motivation index, Savings from implemented employee suggestions, new solutions/products/processes suggested, Background variety index (individual and group level), Company diversification index.

- SC (relationships, organization, renewal and development): Percentage of supplier/customer business accounted for, Length of relationship,

Partner satisfaction index, Customer retention, Administrative expenses/total revenues, Revenues from patents/software/data/databases/etc, Processes completed without error, Cycle/process times, Percentage of business from new products, Training efforts - expense/employee and hours/employee - Renewal expenses/operating expenses, New patents/software/etc.

Previous studies have also highlighted the role of HC (Castanias & Helfat, 2001; Palazzi et al., 2019; Sarto, Saggese, & Viganò, 2022), IC (Demartini & Paoloni, 2013; Del Baldo et al., 2021) as a source of a sustained competitive advantage (Hall, 1986), also in social enterprises (Masciarelli, Di Pietro, & Serpente, 2020).

The literature has also highlighted how HC affect the survival of start-ups (Gatewood, Shaver & Gartner, 1995), in particular the skills and experiences of the founders (Bird, 1993; Fontana & Nesta, 2010) and the other cognitive factors such as their competence (Chandler & Hanks, 1994; Pinelli et al., 2018), education (Rasmussen & Sørheim, 2006), and emotional intelligence (Rhee & White, 2007).

This paper aims to analyze the impact of IC on the revenues of the Italian social gazelles. To carry out this analysis we used the VAIC model which breaks down the IC into two components: the human capital (HC) and the structural capital (SC). This model examines the efficiency of the components of the IC and Capital Employed Efficiency (CEE) to evaluate how they contribute to the corporate performance and value creation (Pulic, 2000, 2004).

In this study that examines non-profit organizations, the VAIC model is used to explain the determinants of a different aspect of performance: revenues, assumed as a proxy of a sustained competitive advantage and of the value created for customers / users. In other words, the hypothesis underlying this study is that the efficiency of the VAIC components, namely Intellectual Capital Efficiency (ICE) and Capital Employed Efficiency (CEE), affect the revenues of these social cooperatives.

We suppose that the efficiency of the HC (HCE) positively affects revenues of social gazelles. As the efficiency of HC increases, the added value created by employees and delivered to customers increases. It derives users' satisfaction which favors the growth revenues.

It derives the following hypotheses:

Hp1. HCE positively affects the revenues of social gazelles.
Hp2. SCE positively influences the revenues of social gazelles.
Hp3. CEE positively affects the revenues of social gazelles.

4. Research Design

4.1. Sample selection and data collection

We used a longitudinal data set consisting of 85 Italian social gazelles over the period 2014-2019 to test our hypotheses.

The process of data collection and sample definition was divided into two steps. First, using the growth and size criteria of the OECD definition, we have identified all the Italian startups that have become gazelles in the period 2018-2019. We set up a search strategy in the Aida-Bureau van Dijk database that selected 2,183 companies born in 2014 (i.e., those up to five years), with at least 10 employees in the second or third year of life (2015 and 2016 respectively) and an average annual growth rate of the number of employees [1] or turnover [2] greater than 20% in the following three years.

$$Employment\ growth\ rate = \sqrt[3]{\frac{Employees_{(t)}}{Employees_{(t-3)}}} - 1 > 0.2 \quad [1]$$

$$Turnover\ growth\ rate = \sqrt[3]{\frac{Turnover_{(t)}}{Turnover_{(t-3)}}} - 1 > 0.2 \quad [2]$$

At the second stage of the data collection process, among the population of 2,183 gazelles, we selected only cooperatives with a social function (i.e., social gazelles). At the end of this procedure, the final sample consists of 85 cross-sectional units (social gazelles) observed over a period of six years, from 2014 to 2019, as shown in Tab. 1.

Tab. 1 - The process of data collection and sample composition

Growth periods	2015-2018		2016-2019		Total obs.	
	N.obs	%	N.obs	%	N.obs	%
Firms born in Italy in 2014* (N = 41,692)					41,692	100.00
Population of Italian gazelles [a]	1,730	4.15	453	1.09	2,183	5.24
Population of cooperative gazelles [a, b]	305	17.63	42	9.27	347	15.90
Final sample: population of social gazelles [a, b, c]	65	3.76	20	4.42	85	3.89

* *Data refers to the companies available in the AIDA Bureau van Dijk database.*
[a] *Companies became gazelles according to the OECD definition*
[b] Gazelle companies having the legal form of cooperatives
[c] Gazelles set up as social cooperatives (Law no. 381/1991 and Legislative Decree no. 112/2017)

4.2. Variables

The dependent variable used in the regression analysis is the natural log of revenues for the period 2014-2019, assumed as a proxy of growth of the social gazelles.

Explanatory variables include the three components of the VAIC model, such as HCE, CEE, and SCE.

To derive these components using accounting data, following the Pulic's approach (2000), we first calculated the Value Added (VA) [3] for the *i*-th social gazelle at year *t*, as follows:

$$VA_{it} = Output_{it} - Input_{it} \quad [3]$$

where:

$Output_{it}$ is the value of production

$Input_{it}$ is the cost of materials, components, and services

Since in this model wages and salaries are not considered as costs but as investments that play a key role in the value creation process, the equation [3] can be reformulated as follows [4]:

$$VA_{it} = OP_{it} + EC_{it} + D_{it} + A_{it} \quad [4]$$

where:

OP_{it} is the Operating Profit.

EC_{it} are the wages and salaries assumed as proxy of Human Capital (HC)

D_{it} and A_{it} represent Depreciation and Amortization, respectively.

After VA has been calculated, we measured the efficiency of the resources used by companies to create value, namely the Human Capital (HC), the

Structural Capital (SC) and the Capital Employed (CE).

To measure the contribution of human capital to the VA, we calculated HCE by dividing the VA by the total employee costs (HC) [5], as follows:

$$HCE_{it} = \frac{Value\ Added_{it}}{Total\ employee\ costs_{it}} = \frac{VA_{it}}{HC_{it}} \quad [5]$$

To obtain SCE, we first proceeded by calculating the structural capital (SC) [6] as follows:

$$SC_{it} = VA_{it} - HC_{it} \quad [6]$$

SC represents the set of support structures, processes and procedures embedded in an organization that enable human capital to function (Khavandkar et al., 2016). To calculate the SCE, we divided the SC of each *i*-th social gazelles at the year *t* to the value created [7]:

$$SCE_{it} = \frac{Structural\ Capital_{it}}{Value\ Added_{it}} = \frac{SC_{it}}{VA_{it}} \quad [7]$$

Finally, we estimated the value the Capital Employed (CE), that represents the book value of assets minus intangible fixed assets (Alipour, 2012), as shown in equation [8]:

$$CE_{it} = Total\ assets_{it} - Intangible\ fixed\ assets_{it} \quad [8]$$

After CE has been calculated, we measured the CEE [9] by dividing the VA to the book value of net assets of *i*-th social gazelle at the year *t*, as follows:

$$CEE = \frac{Value\ Added_{it}}{Total\ Asset_{it} - Intangible\ Fixed\ Assets_{it}} = \frac{VA_{it}}{CE_{it}} \quad [9]$$

To control for some factors potentially affects the revenues dynamic, we also introduced in the regression model the following control variables:

Current ratio (LIQU): calculated by dividing current assets to current liabilities (Gill & Mathur, 2011), included in order to control the impact of the short-term financial balance and the liquidity of companies on revenues of social gazelles.

Financial risk (FIN_RISK): measured through debt-to-equity ratio, considering its impact on firms' growth (Baù et al., 2020).

Firm size (SIZE): calculated using the natural log of the number of employees (Eklund, 2020).

We also introduced six temporal variables to appreciate the effect of the economic cycle on the revenue's dynamic.

4.3. Data analysis and statistical procedure

To analyze the impact of IC on revenues in social gazelles we performed a panel regression analysis with fixed effects specification. The software used to process data and perform the econometric analysis is STATA 14.0 MP.

Before running the regression analysis, we performed several statistical tests to select the most appropriate model for our data and minimize the potential bias. First, Since the Breusch-Pagan/Cook-Weisberg test (p-value < 0.001) revealed heteroskedasticity, we refrained from using pooled Ordinary Least Squares (OLS). To decide whether to apply the model with fixed or random effects, we ran the Durbin-Wu-Hausman test. Since the p-value of the Hausman test is less than 0.001, we reject the null hypotheses that the random-effects model is more consistent than the fixed-effects model. Therefore, we have chosen to adopt the fixed-effects model to test our hypotheses.

Finally, we estimated the following panel regression equation:

$$REV_{it} = \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 SIZE + \beta_5 LIQU_{it} + \beta_6 FIN\_RISK_{it} + a_i + \varepsilon_{it}$$

Where β1, β2 and β3 are the regression coefficients of the sub-components of the VAIC, respectively. β4, β5 and β6 are the estimated coefficients of the control variables. ε represents the error term for the gazelle *i* at the time *t*.

5. Findings

In Tab. 2 we report the descriptive statistics (mean, standard deviation, minimum and maximum values) of the variables included in the regression model for the period 2014-2019.

Tab. 2 - Descriptive statistics of variables used in the regression models

Variables	Obs.	Mean	St. Dev.	Min	Max
Revenues	489	793.48	1653.41	0.00	23510.84
Structural Capital Efficiency (SCE)	463	0.22	2.39	-1.37	51.00
Human Capital Efficiency (HCE)	463	1.30	3.03	-4.17	59.45
Capital Employed Efficiency (CEE)	489	1.47	1.11	-1.90	9.81
Number of employees	489	36.10	64.30	0	569
Current ratio	476	1.54	0.97	0.00	9.54
Debt to equity ratio	489	9.88	31.59	-102.75	192.22

The average value of the revenues of the social gazelles in the period 2014-2019 is 793.48 thousand euros. However, revenues have a high variability, as shown by the standard deviation (equal to 1,653.41 thousand euros). To normalize the distribution and mitigate the impact of outliers, we used the logarithmic transformation of revenues before performing the regression, as reported in section 3. As a result of the logarithmic transformation, revenues show an average value of 5.903 and a standard deviation of 1.516.

Tab. 3 reports the pairwise correlation matrix summarizing the association between revenues and explanatory variables.

Tab. 3 - Pairwise correlation matrix

Variables	REV	HCE	CEE	SCE	SIZE	LIQU	FIN_RISK
REV	*1.000*						
HCE	*-0.099*	*1.000*					
CEE	0.176*	-0.046	1.000				
SCE	*-0.178**	*0.001*	*-0.107*	*1.000*			
SIZE	*0.684**	*-0.090*	*0.276**	*-0.086*	*1.000*		
LIQU	*-0.094*	*0.072*	0.010	0.201*	-0.15*	1.000	
FIN_RISK	*0.126*	*-0.009*	*-0.015*	*0.008*	*0.104*	*-0.101*	*1.000*

All the coefficient denoted by (*) are significant at the level of 5%

HCE is weakly and negatively correlated with REVENUES (r = - 0.099). HCE is also negatively related with CEE (r = -0.046)and SIZE (r = -0.090); but is positively associated with SCE (r = 0.001) and LIQUIDITY (r = 0.072).

CEE is positively and significantly related with the revenues (r = 0.176) at the level of 95% of confidence.

On the contrary, SCE is negatively and significantly correlated with REVENUES of social gazelles (r = -0.178).

Finally, before running the regression analysis, we also checked the Variance Inflation Factors (VIFs). The results of this test are reported in Tab. 4. Both all the VIF coefficients and the mean VIF (1.08) are below the tolerance threshold of 5.00 (O'Brien, 2007), showing that our model is not affected by multicollinearity.

Tab. 4 - Variance Inflation Factors (VIF)

Variables	VIF	1/VIF
HCE	1.04	0.958
CEE	1.12	0.890
SCE	1.11	0.903
LIQUIDITY	1.05	0.957
SIZE	1.11	0.899
LEVERAGE	1.04	0.962
Mean VIF	1.08	

The results of the regression analysis are presented in Tab. 5.

Tab. 5 - Results of fixed-effects (within) panel regression to estimate the impact of the efficiency of IC on the growth of the Italian social gazelles

REVENUES	β	SE	t	P>|t|	[95% CI]	
HCE	0.068***	0.023	2.945	0.003	0.022	0.113
CEE	0.204***	0.041	5.006	0.000	0.124	0.284
SCE	-0.398***	0.103	-3.877	0.000	-0.600	-0.196
SIZE	0.406***	0.063	6.462	0.000	0.283	0.530
LIQUIDITY	0.011	0.043	0.266	0.791	-0.073	0.096
LEVERAGE	0.002	0.001	1.881	0.061	0.000	0.004
YEAR DUMMIES						
Y2014	1.087***	0.122	8.889	0.000	0.846	1.327
Y2015	1.652***	0.132	12.479	0.000	1.391	1.912
Y2016	1.973***	0.138	14.300	0.000	1.701	2.244
Y2017	2.190***	0.141	15.578	0.000	1.913	2.466
Y2018	2.324***	0.139	16.766	0.000	2.051	2.596
Y2019	2.623***	0.173	15.133	0.000	2.283	2.964
N. obs.	456					
N. groups	85					
R-square:						
Within	0.7678					
Between	0.2876					
Overall	0.5389					
F-stat (11, 360)	108.22***					
Prob > F	0.000					

Note: * p-value<.10, **p-value<.005, ***p-value<.10

The regression analysis confirmed hypothesis 1. HCE has a positive effect on the revenues of social gazelles. The coefficient of HCE is positive (=.068) and statistically significant at the level of 1%. In contrast to our hypothesis 2, SCE negatively affects social gazelle revenues at a significance level of 1%. The regression coefficient is negative (=.398). Investments in SC in the social gazelles probably require more time to generate revenue. Start-ups are often characterized by a lack of reputation and to that reason they take longer to win customers and gain market share (Bruna & Nicolò, 2020).

CEE is also statistically significant at the level of 1% and positively affects the revenues of social gazelles, as shown by the regression coefficient (.204). This confirms our hypothesis 3.

As for control variables, the only statistically significant relationship is between size and revenues. Consistent with our arguments about the key role of human capital in the process of creating value in social gazelles, as the number of employees increases, the value of revenues also increases. The regression coefficient of the variable SIZE is positive (=0.406) and significant at the level of 1%.

6. Discussion

This article contributes to the literature on young high-growth enterprises (gazelles), social enterprises, and intellectual capital examining the relationship between IC and the growth of high-growth startup companies set up as social cooperatives. We used the VAIC model to evaluate the effects of these intangible assets on the value creation and growth of social gazelles.

Investments in HC have positive effects on revenue growth already in the short term, i.e. in the first five years of the life of the companies examined in this study, conventionally assimilated to the startup phase. This is because this investment in HC immediately produces positive effects on the quality of the services provided to customers / users of the services provided by social gazelles and this results in revenue growth.

The investment of resources in SC takes longer to produce positive effects on revenues. In the short term it produces negative effects on revenues because it can be achieved by subtracting resources from investments in HC which produce immediate effects on revenues.

This study shows that in social gazelles the investments in HC should be favored over those in SC to sustain a competitive advantage and revenue growth. These social startups create value for customers mostly by investing in knowledge, training, education etc. of their workers rather than in the other the structural components of the IC.

7. Implications, limitations and conclusions

The results of regression analyses show that revenues grow more in social gazelles that invest more in HC. We also find that revenues are negatively related to the investment in SC. In the regression model six temporal dummy variables highlighted a correlation between the trend of the economic cycle and the revenue growth of social gazelles.

This study focused only on Italian social gazelles. This represents the main limitation. Subsequent studies can overcome this limit by examining the relationship between the investments in IC and growth in revenues of social enterprises operating in other countries.

Another possible development of this study is the exam of the relationship between intangible resources and growth for different types of social gazelles in the Italian context (A and B) and operating in different industries (education, healthcare, cleaning services, etc.). A further test should be carried out with reference to the enterprises born in different years and belonging to different cohorts. It would also be interesting to test the relationship between growth and other variables not considered in this research. The development of enterprises is also determined by variables relating to technology, legislation, market forces, etc. (Porter & Van der Linde, 1995). This represents a further limitation of this study.

This research presents both theoretical and practical implications. The theoretical ones concern the contribution on the ambiguous role of the IC with specific reference to high-growth social startups, thus overcoming a gap in the literature. While HCE has a positive impact on revenue growth, the SCE is negatively related to revenues, at least in the short term. Practical implications concern the investment choices considering their effects on revenues. Practical implications derive for planning of investments in IC of social cooperatives in the start-up phase.

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