

Article

The Relationship between Technological Capabilities and Organizational Impact: Direct and Indirect Routes for Employed and Self-Employed Personal Fitness Trainers

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Abstract: The purpose of this study was to investigate the relationships between technological capabilities, individual impact, market agility and organizational impact in employed and self-employed personal trainers hired by fitness centers. The study was performed with 259 personal trainers. Exploratory Factor Analysis, Confirmatory Factor Analysis and a Structural Equation Model were used. The results showed, for the employees, positive relationships between all variables, except for the relationship between individual impact and organizational impact. In contrast, for self-employed personal trainers, only the relationships of technological capabilities with market agility and individual impact, and between the latter and organizational impact, were positive. While the individual variables of the employees show positive relationships with the organizational variables analyzed, this impact could not be determined in the performance of the self-employed. These results are discussed in relation to the previous literature, and possible causes for the differences found between employees and self-employed personal trainers are pointed out. This study's findings indicate that the promotion and consolidation of personal trainers' technological capabilities (TCs), whether they are self-employed or employees, will be key for the fitness centers where they work, by directly influencing the individual impact of the trainers on them and in the organizational performance.

Keywords: technological capabilities; fitness industry; personal trainers; individual impact; organizational impact; market agility; employees; self-employees

1. Introduction

Technology is one of the most outstanding advances of the 21st century. In fact, all sectors are aware of its importance and the need to incorporate not only software that helps to make organizations more efficient, but also to improve people's use of these technologies. Ultimately, organizations are aware of improving technological assets (especially the capabilities of their employees) as a resource to improve competitive advantage [1,2].

In the sports sector, one of the growing subsectors is the fitness market. According to different studies, this has increased considerably in recent years, in the number of consumers, sports facilities

and turnover [3]. Moreover, this sector is closely linked with technology. As an example, according to Statista [4], health and fitness apps represent 5.18% of the total market, being used daily by 35% and several times a week by 40% of people [4]. This situation therefore indicates that the proliferation of fitness apps has increased to improve health, to promote physical activity in indoor/outdoor sports facilities and even to correct poor eating or behavioral habits [5]. However, this technology must be used correctly by prescribers and managers of physical activity in order to be utilized efficiently by consumers and service providers. Thus, the data provided by the European project “Digi-Sporting, a new step towards digital transformation through sports science”, show that professionals in the sports sector must develop digital skills for a better use of technologies in the sports sector [6] and therefore must develop and improve their technological capabilities (TCs).

These conclusions are important due to the importance that technology and their uses has in creating competitive advantages [7]. However, so far, the impact of TC on the performance individuals and organizations at sport context has not received the necessary attention.

In fact, it would be necessary to have knowledge of whether digital skills, digital knowledge and, ultimately, TCs differ according to the characteristics of the employees. In particular, in European Union (EU), 32.6 million persons aged 15 to 74 were self-employed in 2018; they accounted for 14% of total employment; in Spain, 16% of workers were self-employed [8]. To understand the circumstances of these people, it is necessary to investigate the characteristics of their work performance and the differences between them and those of the employees [9–11]. Self-employed professionals are characterized by having greater autonomy than employees [12–14], perceiving higher job demands than those [15], reporting higher levels of work satisfaction [15] and staying more engaged [16].

These different characteristics among employees could also affect TC. Thus, the literature has not found differences in the use of their skills [12], although this aspect needs to be investigated in greater depth since self-employed report their lack or weakness of skills to a lesser extent than the employed [17]. That is why this study aims to know the relationships between TCs and individual impact, organizational impact and market agility in personal trainers hired by fitness centers both in self-employee and employee form.

2. Theoretical Framework

2.1. Technological Capability in Companies

Over time, researchers have sought to understand why companies perform differently. There have been several interpretations of this reality. In some cases, it has been said that the difference was based on the strategy adopted by each one of them in relation to the market, since, for example, some adopted a strategy of being a leader in low costs, and others were based on differentiation [18]. However, in the face of inconsistencies in these theories, another approach was developed which established that the differences in performance were not to be found in competitive aspects external to the company, but that internal factors were the determinants of the differences in the performance of companies. It is on this approach that the theory of resources and capabilities, called a resource-based view (RBV) by the strategic literature, is based [8,19].

According to the researchers in strategic management, the RBV has its origins in previous studies [19–21], where the resources and capabilities are the key elements for companies. This strategy suggests that the best way to analyze a firm is as a collection of imperfectly imitable and firm-specific resources and capabilities that enable it to compete successfully against other firms [19,22,23].

For the RBV, the organization is a set of resources that shape its specific competitive advantages. It therefore moves from the analysis of the portfolio of products or businesses [18,24] to the analysis of the portfolio of resources which are used in the different products [25].

Under this view, it is argued that the achievement of a sustainable competitive advantage depends on the company possessing certain specific resources (strategic resources). That is, resources that have a series of characteristics which give them their strategic character and, hence, that are capable

of providing the company with long-term economic returns which are higher than normal [26]. This would explain the difference in performance between the different companies in the market. Barney [8] argues that resources that generate a sustainable competitive advantage must satisfy four conditions: They must be valuable, scarce, inimitable and non-substitutable.

The finding that competitive advantage rather than external conditions is the main source of difference in profits between firms leads to a focus on discovering the sources or roots for that competitive advantage. Although the literature on competitive strategy has placed an emphasis on strategic positioning issues in terms of the choice between cost competition or differentiation, and between a wide or narrow market, the most important and substantial consideration of these choices is the firm's resource position. Thus, the ability to establish a cost advantage requires, for example, a superior information TC or ownership of low-cost sources of raw materials or an efficient plant size [27].

Within the current dynamic environment, TC becomes a very relevant asset in business performance [28], in the competitive advantage of enterprises [29] and in the decisions related to the sustainability of the company [30], and an important support in innovation [31]. TC is a key factor in supporting the growth, development and adaptation to change of companies, and could be defined as a firm's ability to acquire, deploy, combine and reconfigure technological resources, knowledge and skills in support and improvement of the output of companies [32–34].

2.2. Relationships between TC, Individual Impact and Organizational Impact

According to Delone and McLean [35], and in a technological context, the individual impact is a complex concept to define, linked with performance but at an individual level. The individual impact could be an indication that a technological system gives the user, customer or anyone a better understanding of the current context and, as a result, improves his/her performance, productivity, or any type of output measurement [35]. Individual impact has been investigated in employees, but no specific study in the literature has been conducted, to our knowledge, with self-employees. In studies prior to Delone and McLean [35], it is argued that the TC has not a value in itself, and that the value comes through the influence on business decision-making [36].

In some previous studies, when analyzing the TC and its components, the knowledge dimension has been included, and how this dimension impacts on an organization's employees and helps to improve the decision-making process and their productivity [37]. Furthermore, it is not enough to have this knowledge, it must also be correctly applied in problem solving [38] and, additionally, it must be able to be transmitted to other employees, partners or suppliers [39]. Knowledge, skills and the impacts on the improvement of work processes determine the productivity at the individual level and, therefore, on the organization's performance [40].

Thus, it can be indicated from the studies of these researchers, that certain capacities and intangibles assets of the organizations (i.e., TC), can impact on the results and on the employees' behaviors in their work place, making them more productive and motivated [40]. Thus, Alavi and Leidner [41] stated that despite the fact that most knowledge management theories are based on organizational and strategy theories, more knowledge management initiatives involve technological capabilities to a greater or lesser extent [41–44].

The concept of organizational impact refers to the different dimensions that organizational performance can present, such as profitability, market share, sales, customer value, operational performance or financial performance, among others; several investigations have studied these dimensions of organizational performance [45–52].

TC is considered an integral part of the research stream on the value of technological resources for businesses and, in general, the prior studies emphasize the concept's multidimensionality and the necessary complementarity with means and organizational capabilities for the generation of value [53]. There are numerous studies in the literature based on the relationship between TC and business performance [45–52,54–61], and the results have shown that there is a direct relationship between

both concepts, and also an indirect relationship through other organizational capabilities. This means clear evidence for organizational managers to perceive the value of TC for their enterprises, since the performances obtained are often intangible or difficult to quantify. However, achieving these results depends on the ability of the enterprise to transform technological investments into assets that can form a unique TC over time [53,62].

One of the most relevant organizational impacts on service companies, such as fitness centers, is to be able to analyze the relationship between the TC and customer service. Karimi, Somers and Gupta [63] argue that, in different industries, TC has impacted on customer service, through transforming marketing, offering new products, enabling electronic access to new products and services, or sharing information to improve customer satisfaction while achieving cost reduction. These authors also argued that companies with a better ability to plan and integrate their technological resources and to provide accurate, timely and reliable information to their stakeholders are more effective in improving customer relationships. Sharing information between technological resources and customer service units has a positive influence on improving knowledge about customers and related business processes [48,64].

Therefore, this paper proposes the following hypotheses (Figure 1):

Hypothesis 1. *TC and individual impact are positively related.*

Hypothesis 2. *TC and organizational impact are positively related.*

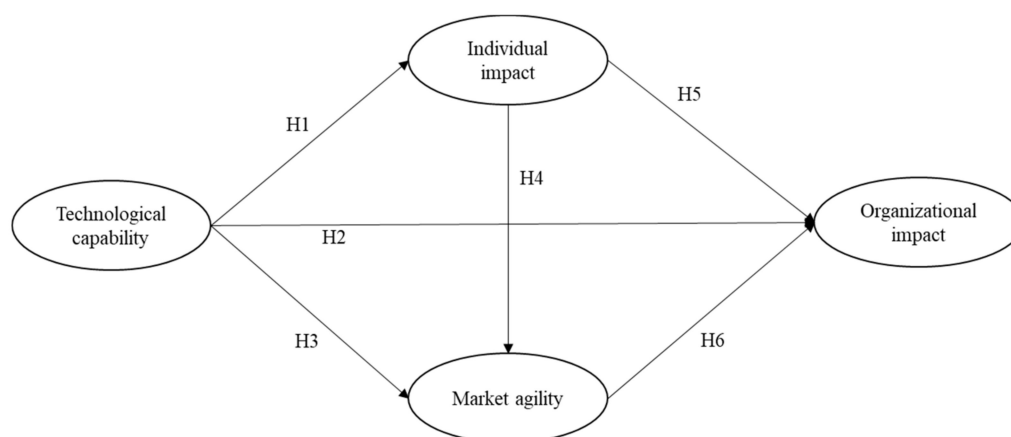


Figure 1. Structural model for hypothesis testing.

2.3. Relationship between TC and Market Agility

According to Prahalad [65], in today's dynamic business environments firms must be flexible and agile and be able to manage extreme changes, survive unprecedented threats and seize opportunities [32]. Therefore, organizational agility is a firm's capability to face rapid and uncertain changes and improve in a competitive environment of continually and unpredictably changing opportunities [32,66,67].

According to Lu and Ramamurthy [32], two types of organizational agility are possible: market capitalizing agility and operational adjustment agility. The current study focuses on the market capitalizing agility, which refers to a firm's capacity to quickly respond to changes through continuously monitoring and rapidly improving products or services to address consumers' needs. This agility implies a dynamic, aggressively change-embracing and growth-oriented entrepreneurial mindset about strategic direction and decision-making in uncertain conditions [68,69]. Operational adjustment agility refers to a firm's capacity in its internal business processes to physically and quickly face market and environment changes [66,68].

TC remains one of the most effective instruments in neutralizing threats and exploiting the opportunities offered by the environment, as shown by numerous empirical works [70–78]. However, although some studies have begun to link TC with competitive advantage [54,79–81], the link between

them and organizational agility is not clear in current business environments [32,82]. There are not many works in the previous literature that empirically study the relationship between TC and agility, so this paper fills that gap.

In general, prior studies have asserted that TC can enable agility by speeding up decision-making, facilitating communication and responding quickly to changing conditions [32,83]. Nonetheless, some studies have also pointed out that technological resources may be an inconvenience and sometimes even impede organizational agility [82–85]. This is partly due to the relatively fixed physical and technological artefacts of information systems [86,87]. Technological resources become critical in building the digital platform that provides agility for firms [68,85].

Therefore, this paper proposes the following hypothesis (Figure 1):

Hypothesis 3. *TC and market agility are positively related.*

2.4. Relationships between Individual Impact, Market Agility and Organizational Impact

In the current dynamic and changing environment, companies that want to maintain sustainable competitive advantages must be able to offer a great ability and acquisition of new ideas or knowledge to adapt to the environment in order to satisfy the requirements of customers, employees, shareholders, government and society in general [88]. This objective of adaptation to the environment and continuous organizational learning must be achieved through the development of internal organizational capacities, called dynamic capacities in the literature, and which allow companies to achieve this objective in order to evolve, advance, grow, adapt and, ultimately, survive [89]. In this sense, and according to Lu and Ramamurthy [32], the idea of market agility means focusing on knowledge management or intellectual ability to find appropriate things to act on [66]. Thus, those companies with greater organizational agility will be those that are able to adequately manage the knowledge at their disposal, capturing it, transferring it and applying it in the right place and at the right time, as well as promoting the development of internal capacities and skills that help in the decision-making process of employees at an individual level, and allow companies to achieve better results at an organizational level [32,90]. Other studies refer to the combination of employee competences, like education, professional skills, know-how and knowledge from experience; moreover, the attitudes and intellectual agility allow openness to change, innovativeness, creativity and organizational flexibility [91–94]. The sum of all intangible assets (knowledge, capacities, skills, etc.) combined with tangible assets contributes to the organization's success, generating superior value and improving performance [95]. According to Sambamurthy et al. [68] and Volberda [69], and their idea about market agility, firms which have a market agility capability can rapidly respond to changes and challenges through continuously monitoring and quickly improving products/services to address customers' needs. The managers often emphasize the importance of market analysis and the prediction of environmental changes, although the environment remains highly uncertain and even major changes are often not forecast [96,97], such as the 2008 financial crisis that seriously affect sports businesses [98], or the COVID-19 crisis in 2020 that has emphasized the need to understand the technological capabilities of workers as a necessary precedent for market agility [99].

According to Queiroz et al. [100], and aligned with Sirmon et al. [101], companies renew or restructure their resource portfolios by purchasing resources, developing resources and capabilities internally. These are key competences that affect the ability of companies to generate performance from their resource base. Additionally, there are numerous studies in the literature which analyze and test the positive relationship between agility and results, so agility is considered as a key antecedent of the results in organizations [93,102,103].

Therefore, this paper proposes the following hypotheses (Figure 1):

Hypothesis 4. *Individual impact and market agility are positively related.*

Hypothesis 5. *Individual impact and organizational impact are positively related.*

Hypothesis 6. *Market agility and organizational impact are positively related.*

3. Method

3.1. Participants

In total, 259 Spanish personal trainers, 70 women (27%) and 189 men (73%), participated in the study. Of these personal trainers, 92 were under 30 years old (35.5%), 99 between 31 and 40 years old (38.2%), 57 between 41 and 50 years old (22%) and 11 (4.2%) older than 50 years. Regarding their experience as personal trainers, 13 (5%) had less than 6 months of experience in that position, 11 (4.2%) between 6 and 12 months, 30 (11.6%) between 1 and 2 years, 80 (30.9%) between 2 and 5 years and 125 (48.3%) over 5 years. Regarding the socio-labor context of the participants, 23 of them worked in a public company (8.9%), 185 for a private company (71.4%) and 51 for private non-profit companies (19.7%). This work performance was carried out in the form of company employees in 91 cases (35.1%) and other modalities for 52 participants (e.g., internship contract, training and apprenticeship contract, etc.) (20.1%) (total: 143 employed personal trainers, 55.2%) and self-employment in 116 cases (44.8%). This work took place in cities with less than 50,000 inhabitants for 82 participants (31.7%), while 177 (68.3%) of them carried out their work in cities with more than 50,000 inhabitants.

Regarding their technological immersion environment, the majority ($n = 231$, 89.2%) considered that technology was important for customer management, for the commercialization of services ($n = 231$, 89.2%) and for prescription and training control ($n = 182$, 70.3%) (Table 1).

Table 1. Technological immersion environment.

	Importance Attached to Technology in Customer Management		Importance Attributed to Technology in the Commercialization of Services		Importance Attached to Technology for Prescription and Training Control	
	N	%	N	%	N	%
Absolutely disagree	2	0.8	3	1.2	4	1.5
Disagree	3	1.2	1	0.4	15	5.8
Indifferent	22	8.5	23	8.9	57	22.0
Agree	98	37.8	87	33.6	81	31.3
Absolutely agree	133	51.4	144	55.6	101	39.0

Beyond these beliefs, 132 participants (51%) used software to manage training, sports activities and reserves, while the remaining 127 (49%) did not use it. Along the same lines, 99 of these personal trainers (30.2%) used some software for client management and administration, while 160 (61.8%) did not have any.

3.2. Measurements

All the scales are adopted from standard measures available in the literature. The TC variable was measured by Correa and Díaz's [64] scale. This scale measures the TC with 23 items made up of six dimensions (knowledge in technology—four items; strategic capacity—four items; personal—four items; inter-organizational relationships—four items; supplier relationships—three items; and infrastructure—four items), the individual impact and organizational impact scales [104], made up of three and six items, respectively, and the market agility scale (three items) [32].

In addition, a sociodemographic data questionnaire was constructed ad hoc to collect information about the personal and socio-occupational characteristics of the participants. The questions were related to gender, age, experience as personal trainers, the contractual situation, the type of company in which they carried out their work, the number of inhabitants of the city where they worked, their attitudes about technology in their jobs and the use of software to support it.

3.3. Procedure

The collection of data was carried out through a personal trainers' platform that has its digital services in different countries of the world. This platform puts clients in contact with personal trainers, and a price is negotiated between the personal trainer and the client. The platform is a mediator between the service provider and the client. This platform is the largest search engine for personal trainers and training centers in the world. You can currently find personal trainers online in Spain, Chile, the United Kingdom and the United States of America. The researchers contacted those responsible for the platform and the delivery by the platform to all their personal trainers in Spain was finalized. The information was collected through an online questionnaire that was accessed by personal trainers. The data were collected within three weeks.

3.4. Data Analysis

According to Hoe [105], as a rule of thumb, any number above 200 is understood to provide sufficient statistical power for data analysis. In order to achieve the study objectives, a sample size of 259 is appropriate for testing the study's model fit and hypotheses, for low complexity models exceeding the minimum ratio 5:1 [106,107]. Exploratory Factor Analysis (EFA) was carried out to group the thirty-five items left from the pre-testing stage of the questionnaire, as recommended by Anderson and Gerbing [108], using Principal Components Analysis and Oblimin oblique rotation. We had previously tested the factorization conditions, using the Bartlett and Kaiser–Meyer–Olkin tests. Additionally, the normality of the data was calculated by using skewness and kurtosis values. Confirmatory factor analysis (CFA) and a reliability test were performed in order to evaluate the dimensionality and psychometric properties of the study's constructs. To check whether the measurement model fit the data, the χ^2 and its differences of degrees of freedom ($\chi^2/df \leq 3$) [109], the Comparative Fit Index ($CFI \geq 0.90$), the Tucker–Lewis Index ($TLI \geq 0.90$), the Incremental Fit Index ($IFI \geq 0.90$) [110], the Parsimony Comparative Fit Index ($PCFI \geq 0.80$) [111] and the Root Mean Square Error of Approximation (RMSEA [112,113]) were utilized to confirm the goodness-of-fit index criteria [114]. In addition, the composite reliability (CR) and average variance extracted (AVE) were calculated. Both the CR and AVE indices based on factor loading values were computed (≥ 0.50) [115] to examine whether all the constructs met the recommended level of 0.70 for CR and 0.50 for the AVE [110,116]. Evidence of the measure's validity is provided by the fact that all the factor loadings are significant and above the recommended value of 0.60 [115], suggesting an adequate item reliability [110]. The discriminant validity was established when AVE values for each construct exceeded the square of the correlations between them [116]. After confirming the validity and reliability of each construct, the structural equation model was tested, using AMOS 21.0 to analyze the predicted hypothesized relationships between the variables for the present study. Each indicator was connected to its theoretical construct in a reflective manner as well as linked accordingly to the hypothesis. The structural model was evaluated by using the same fit indices as the confirmatory factor analysis.

4. Results

The data provided were found fit for EFA, since the statistical results of Bartlett's test of sphericity (approximately chi-square = 0.96, $df = 595$, $p = 0.000$) and the Kaiser–Meyer–Olkin (KMO = 0.961) measure are satisfactory, indicating the high correlation essential for conducting EFA. The result showed that the 35 items were loaded into their entitled nine factors, accounting for 75.33% of the total variance explained. The values for univariate skewness and kurtosis for all the variables were satisfactorily within conventional criteria for normality (-3 to 3 for skewness and -7 to 7 for kurtosis) suggested by Finney and DiStefano [117] and supported the normality for structural equation model analysis.

Next, the psychometric properties of the nine factors were also assessed. CFA, using a maximum likelihood estimation method, was performed on the measurement model, and a satisfactory goodness-of-fit statistic was found ($\chi^2(518) = 1272.98$ ($p < 0.001$), $\chi^2/df = 2.45$; $CFI = 0.93$; $TLI = 0.92$; $IFI = 0.93$; $PCFI = 0.81$;

RMSEA = 0.075 (CI = 0.070–0.080)). The factor loadings (λ) for each item in the measurement model are presented in Table 2 and were found to range from 0.69 to 0.97, values higher than the recommended cutoff level of 0.60 [110,116], except for item TC23 (“I make purchases and/or sales online”), which showed a weak factor loading value ($\lambda = 0.541$) and was removed without affecting the adjustment indices used.

Table 2. Measurement scales, reliability, validity and dimensionality statistics.

Scale/Items	EFA Factor Loadings	CFA Factor Loadings
Technological capabilities		
Knowledge of technologies ($\alpha = 0.911$; CR = 0.90; AVE = 0.70)		
I have a high degree of knowledge in information technology (TC1)	0.790	0.820
I am well informed about innovations based on information technology (TC2)	0.824	0.812
I have the ability to quickly apply the new technologies available (TC3)	0.769	0.832
I have the ability to manage technology projects (TC4)	0.854	0.878
Strategic capacity in technologies ($\alpha = 0.864$; CR = 0.87; AVE = 0.63)		
I have a clear vision about how technologies can increase the value of my company (TC5)	0.834	0.834
I consider planning for the technological processes of my business to be important (TC6)	0.717	0.772
I promote and encourage the planning of technologies (TC7)	0.854	0.855
I have a detailed program on how to implement technologies (TC8)	0.721	0.696
Technology personal ($\alpha = 0.946$; CR = 0.94; AVE = 0.80)		
I am clear about the goals of our organization and its link with technologies (TC9)	0.854	0.895
I have a thorough understanding of business priorities and their link with technologies (TC10)	0.878	0.947
I fully understand the organization’s policies and their link with technologies (TC11)	0.840	0.868
I understand the procedures of my business and its link with technologies very well (TC12)	0.855	0.875
Inter-organizational relations ($\alpha = 0.942$; CR = 0.94; AVE = 0.81)		
If there are people linked to technologies in my environment, they trust me (TC13)	0.867	0.922
If there are people linked to technologies in my environment, they consult me (TC14)	0.825	0.898
If there are people linked to technologies in my environment, we appreciate both parts of our work (TC15)	0.851	0.931
If there are people linked to technologies in my environment, our relationship is one of respect (TC16)	0.760	0.835
Supplier relations ($\alpha = 0.943$; CR = 0.94; AVE = 0.85)		

Table 2. Cont.

Scale/Items	EFA Factor Loadings	CFA Factor Loadings
My technology providers inform me promptly when they have problems that may affect the service they provide us with (TC17)	0.857	0.920
I trust the ability of my technology providers to respond to my technology needs in a timely manner (TC18)	0.852	0.935
There is a very trustworthy relationship between technology providers and myself (TC19)	0.852	0.905
Infrastructure ($\alpha = 0.808$; CR = 0.77; AVE = 0.53)		
I have people in charge of giving me support and advice on technologies (TC20)	0.856	0.745
I invest annually in technologies (TC21)	0.750	0.723
The computer equipment that I have or we have is connected to the network (TC22)	0.653	0.706
Individual impact ($\alpha = 0.967$; CR = 0.97; AVE = 0.91)		
The computer system improves my productivity (ID1)	0.853	0.971
The computer system allows me a faster information processing (ID2)	0.807	0.936
The computer system improves my work (ID3)	0.844	0.951
Organizational impact ($\alpha = 0.961$; CR = 0.96; AVE = 0.80)		
The computer system I use provides a competitive advantage over rival companies (OI1)	0.870	0.858
The computer system I use provides better client/coach relationships (OI2)	0.891	0.891
The computer system I use provides opportunities to develop additional income (OI3)	0.879	0.878
The computer system I use provides an improved corporate image (OI4)	0.920	0.935
The computer system I use provides better customer service (OI5)	0.920	0.931
The computer system I use keeps up to date with the business requirements of the organization (OI6)	0.872	0.877
Market agility ($\alpha = 0.914$; CR = 0.92; AVE = 0.79)		
I hurry to make and implement appropriate decisions in the face of changes in the market/clients (MA1)	0.810	0.827
I am constantly looking for ways to reinvent/redesign our organization to better adapt to the market (MA2)	0.790	0.915
I treat market changes as opportunities for rapid change (MA3)	0.789	0.919

Notes: CFA, confirmatory factor analysis; EFA, Exploratory Factor Analysis; TC, technological capability; α , Cronbach alpha; CR, composite reliability; AVE, average variance extracted.

All composite reliability values surpassed the requirement of 0.70 (ranging from 0.77 to 0.97). In addition, the average variances extracted in the case of the 9 study constructs were all above the 0.50 level (ranging from 0.53 to 0.91), thus indicating high levels of convergence between the indicators

in measuring their respective constructs. On the other hand, all the factorial charges were statistically significant (Z -valor ≥ 1.96), situated between 9.11 and 37.09, thus indicating evidence of convergent validity. Lastly, the extracted median variance of each latent variable was above the squared correlations between each one, also purporting evidence of discriminant validity [116] (Table 3).

Table 3. Discriminant validity for the measurement model according to the Fornell–Larcker criterion.

Dimensions	CR	AVE	KNO	SCT	TP	I-OR	SR	INF	ID	OI	AM
Knowledge of technologies	0.90	0.70	1.00								
Strategic capacity in technologies	0.87	0.63	0.59	1.00							
Personal technologies	0.94	0.80	0.63	0.78	1.00						
Inter-organizational relations	0.94	0.81	0.74	0.72	0.72	1.00					
Supplier relations	0.94	0.85	0.48	0.62	0.56	0.66	1.00				
Infrastructure	0.79	0.53	0.52	0.45	0.51	0.42	0.49	1.00			
Individual impact	0.97	0.91	0.41	0.54	0.35	0.37	0.22	0.37	1.00		
Organizational impact	0.96	0.80	0.42	0.55	0.45	0.47	0.37	0.53	0.63	1.00	
Market agility	0.92	0.79	0.52	0.66	0.50	0.55	0.40	0.61	0.65	0.66	1.00

Notes: CR, composite reliability; AVE, average variance extracted; KNO, knowledge of technologies; SCT, strategic capacity in technologies; TP, technology personal; I-OR, inter-organizational relations; SR, supplier relations; INF, infrastructure; ID, individual impact; OI, organizational impact; MA, market agility.

Lastly, structural equation model was applied to test the proposed hypotheses. The results ($\chi^2(510) = 0.715$ ($p < 0.001$), $\chi^2/df = 2.53$; CFI = 0.92; TLI = 0.91; IFI = 0.91; PCFI = 0.84; RMSEA = 0.077 (CI = 0.072–0.082)) indicate an adequate global model fit [110,114]. The model explained 74% of the variance and all the relationships showed significance, the TC showed greater predictive value on the individual impact ($\beta = 0.68$), the individual impact on market agility ($\beta = 0.49$) and market agility on organizational impact ($\beta = 0.35$). Regarding the typology of personal trainers, the model was tested by using two groups according to the nature of the socio-labor context. The coefficients for each model are shown in Table 4.

Table 4. Summary results of the structural model for each group.

H	Relationship	Self-Employed Personal Trainers			Employed Personal Trainers		
		Confirmed	B	Z-Value	Confirmed	B	Z-Value
H1	TC -> ID	Yes	0.59 ***	5.94	Yes	0.71 ***	8.89
H2	TC -> OI	Yes	0.35 ***	3.36	No	0.05	0.51
H3	TC -> MA	Yes	0.58 ***	5.35	Yes	0.40 ***	5.55
H4	ID -> MA	Yes	0.32 ***	3.63	Yes	0.60 ***	8.85
H5	ID -> OI	Yes	0.42 ***	4.88	No	0.21	1.62
H6	MA -> OI	Yes	0.21 *	2.01	Yes	0.62 ***	3.40

Notes: H, hypothesis; TC, technological capability; ID, individual impact; OI, organizational impact; MA, market agility; * $p < 0.05$; *** $p < 0.001$.

In the model for self-employed personal trainers, five of the six paths were significant, and they explain 75% of the variance in the organizational impact. Specifically, TC showed a significant influence on organizational impact ($\beta = 0.35$), as well as the same predictive value on individual impact ($\beta = 0.59$) and market agility ($\beta = 0.58$), but when analyzing the influence of these variables on the organizational impact, it was the individual impact that showed the highest predictive value ($\beta = 0.42$). Although a positive relationship was obtained between the individual impact and the market agility ($\beta = 0.32$), the predictive value of the latter variable on the organizational impact was not significant ($\beta = 0.21$; $p = 0.06$). The model that analyzed the sample of non-self-employed personal trainers explains 74% of the variance in the organizational impact. In this case, there were four significant paths, the influence of individual impact ($\beta = 0.21$; $p = 0.10$) and TC ($\beta = 0.05$; $p = 0.61$) on organizational impact being not significant. TC, as in the model of self-employed personal trainers, showed greater predictive value

on individual impact ($\beta = 0.71$) than on market agility ($\beta = 0.40$), individual impact was also a strong predictor of market agility ($\beta = 0.60$) and this in turn, on the organizational impact ($\beta = 0.62$) (Figure 2).

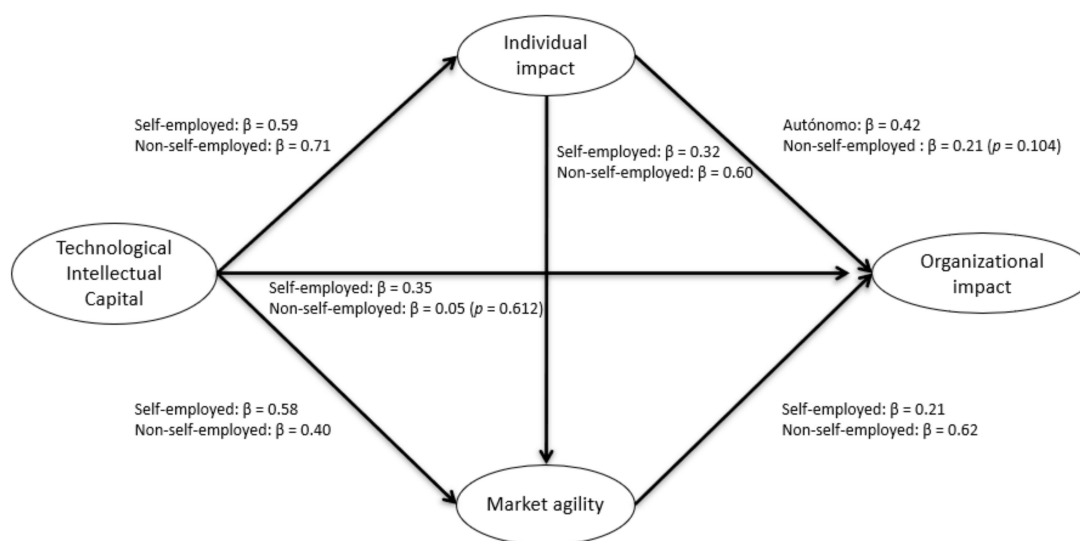


Figure 2. Research model with path coefficients.

In both models, an adequate adjustment was obtained for the different indices considered: self-employed personal trainers $\chi^2(510) = 933.45$ ($p < 0.001$), $\chi^2/df = 1.83$; CFI = 0.90; TLI = 0.90; IFI = 0.90; PCFI = 0.81; RMSEA = 0.080 (CI = 0.066–0.084); non-self-employed personal trainers $\chi^2(510) = 1169.65$ ($p < 0.001$), $\chi^2/df = 2.29$; CFI = 0.91; TLI = 0.90; IFI = 0.91; PCFI = 0.82; RMSEA = 0.079 (CI = 0.067–0.088).

5. Discussion

The objective of this work was to investigate the relationships between TC and individual impact, organizational impact and market agility in self-employed and employed personal trainers hired by fitness centers. Thus, Hypothesis 1 predicted a positive relationship between TC and individual impact, an aspect that is confirmed for both employed persons and those who are self-employed. This finding is consistent with those previously provided by Delone and McLean [35], who pointed out that workers' TCs would be directly related to their performance, by allowing them a better understanding and adaptation to the context in which they are immersed. Furthermore, Aulawi et al. [118] indicated that this relationship would be mediated by the ability of workers to share their technological knowledge. The relationship between TC and individual impact seems to remain the same regardless of whether the workers are employed or self-employed; so, the influence of organizational and/or contractual factors would not have weight on this occasion.

Regarding the relationship between TC and organizational impact, it was proposed that they would be positively related (Hypothesis 2). In view of the results, this hypothesis is confirmed for the employees, but not for the self-employed workers. The positive and direct relationship between technological capability and organizational impact of employed workers is consistent with the extensive previous literature on the matter [45–52,54–61]. For Karimi et al. [63], this positive influence is explained by the ability of workers with greater technological competence to quickly and reliably obtain information from users and the processes related to them, and based on this knowledge, improve and diversify the service provided to them.

To our knowledge, there are no previous works in the literature that explain the differences found in the relationship between TC and organizational impact between employees and self-employees; Melville et al. [119] suggested that this relationship was mediated by factors such as the complementary organizational resources of the company and its business partners. Perhaps the organizational resources

available to employees and self-employees explain these differences, which will have to be studied in depth.

On the other hand, Hypothesis 3 foresaw a positive relationship between TC and market agility, a relationship that is confirmed for both the employees and the self-employed. The previous literature showed contradictory results concerning this relationship. While some authors pointed out a positive relationship between TC and market agility [32,84], others indicated that TC could be a barrier that hindered market agility [83–85]. These contradictory results may be due to the multi-causal origin of market agility and that it is not reflected in the studies reviewed. Although market agility requires workers' TCs, it is no less true that other factors specific to customers, suppliers, the organizational climate and the leadership style within each organization also play a decisive role [120]. Lu and Ramammurthy [32] also investigated these contradictions, pointing out that workers' TCs have a positive impact on market agility, but not the investment in companies' technological equipment.

For our sample workers, the contractual relationship with the fitness service offered does not seem to create differences in the relationship established by their TCs with the agility in front of the market that they provide. Perhaps the fact that the offer is produced through a common interface to which all the internal clients adapt to homogenizes this relationship; this possibility must be studied in future research.

Hypothesis 4 indicated that there would be a positive relationship between individual impact and market agility. The results allow us to accept this hypothesis for employees but not for the self-employed. As Teece et al. [89] pointed out, those companies that wish to adapt successfully to changing environments must develop their internal organizational capacities. These capacities will allow openness to change, innovation, creativity and organizational flexibility [91–94]. As Chelladurai [121] has already indicated for the sports industry, the management of the individual resources of company's workers will be key to its survival in the context of the rapid and constant change that characterizes the current business of physical activity and sport. In fact, right now, with COVID-19, the adaptability and empowerment of TCs are necessary, to offer customers what they want, when they need it, thus ensuring companies' sustainability [122]. Both individuals and organizations must change to stay current with the changing world around them, and individuals who cannot change as fast as their work demands have a limited impact [123].

However, individual impact and market agility have a positive relationship only for employed personal trainers. This unexpected result could be due to the modulating factor of the decision-making and information transmission processes that mediate between individual impact and market agility [1]; therefore, decision-making processes carried out by employed and self-employed personal trainers should be investigated.

Furthermore, individual impact was postulated to be positively related to the organizational impact (Hypothesis 5). This hypothesis is confirmed for the group of self-employed personal trainers, but not for those who are employees. This absence of a relationship with respect to employees is contrary to the previous literature, which widely endorses this relationship in aspects of organizational impact such as the innovative behavior of the front-line service [124], the overall performance of the organization [125,126], service orientation [127], efficiency [126], continuous organizational growth [128], innovation [129,130] and the creation of value for the client [131]. The aforementioned studies were developed in face-to-face settings, so the contradictory results could be explained by the change to the online space, an aspect that should be addressed in future research.

Lastly, Hypothesis 6 proposed that market agility would be positively related to organizational impact, a hypothesis that is confirmed for personal trainers who are employees, but not for those who are self-employed. This positive relationship between market agility and organizational impact in the case of employees in fitness centers is consistent with previous studies by Chen et al. [93], Roberts and Grover [102], and Tallon and Pinsonneault [103] in business contexts, as well as the results obtained by Kourosh et al. [132] for sports product companies. Perhaps, in the case of employees, market agility (and its correlate in organizational impact) is the product of a marketing process that involves an entire

company [96,97] more than an individual effort of the personal trainer. This aspect must be analyzed in future studies, as well as the factors that determine the success of self-employed personal trainers.

5.1. Managerial Implications

This work has important and relevant managerial implications. Firstly, managers must take into account TCs and, therefore, invest in them if they want to improve the productivity and performance of their employees. These capabilities will impact on workers not only being able to do their tasks more easily and quickly, but also being more motivated by feeling that they are doing their job more efficiently. Additionally, to a greater productivity of the employees, the organization will also be more productive. Secondly, this greater orientation of the company towards TC will make the company more flexible and agile in the market, which is a relevant dynamic capability that will help companies to develop sustainable competitive advantages in the market. Thirdly, those managers who understand that TCs are necessary in their organizations and invest in them will achieve an improvement in the performance of their companies. In short, companies that improve, renew and focus on TC will make both their workers, departments and the organization as a whole achieve improved results, and thus achieve competitive advantages that differentiate them from their competitors and remain in the market in the long term. Finally, the findings have shown the importance of TC, so it is convenient for governments and public administration to understand the importance of greater investment in digital skills. In this way, public policies should make an effort to consider a greater economic investment that promotes training and development programs in TC in companies and self-employees.

5.2. Limitations and Future Investigations

Like all research work, this study also has limitations. Firstly, the sample used was obtained from Spain; this means that the competencies and professional development of personal trainers could be different from those of other countries. Likewise, having carried out this study before the COVID-19 situation also results in a post-COVID-19 situation possibly modifying personal trainers' TC and adaptation to different work contexts [133]. Although the authors are aware of these limitations, they could also be the first link for future research; in fact, future work should analyze samples of personal trainers, both employees and self-employees, of the sports sector from different types of organizations and spaces for interaction with external clients, in different sport contexts and countries. These investigations, in turn, should be carried out in post-COVID-19 situations, as they could be modified by the current need for personal trainers to develop their digital skills and TC. Due to this research's findings, more research is needed to promote and investigate TC with different measures and scales, since, due to the new world situation, this variable could be very useful for the organizational impact of sports entities.

Finally, authors have identified, for employees and self-employees, different relationships between constructs closely linked to organizational performance and therefore to the sustainability of their companies. While the individual variables of the employees show positive relationships with the organizational variables analyzed, this impact could not be determined in the performance of the self-employed; for this reason, these relationships and other associated should be studied in more depth in the future.

6. Conclusions

This study's findings indicate that the promotion and consolidation of personal trainers' TCs, whether they are self-employed or employees, will be key for the fitness centers where they work, by directly influencing the individual impact of the trainers on them. In fact, the TCs of personal trainers who are employees positively influence the organizational impact of fitness centers. Likewise, an effective strategy to improve the market agility of fitness centers is to ensure their personal trainers' TCs. In relation to the individual impact of personal trainers who are employees, this is directly related to the market agility of the fitness centers where they work. Likewise, the individual impact of personal

trainers who are employees is directly related to the organizational impact of their fitness centers. Finally, for self-employed workers, market agility is positively related to organizational impact, and the individual impact of self-employed personal trainers is directly related to organizational impact.

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References

- García-Sánchez, E.; García-Morales, V.J.; Martín-Rojas, R. Influence of Technological Assets on Organizational Performance through Absorptive Capacity, Organizational Innovation and Internal Labour Flexibility. *Sustainability* **2018**, *10*, 770–795. [CrossRef]
- Mao, H.; Liu, S.; Zhang, J.; Deng, Z. Information technology resource, knowledge management capability, and competitive advantage: The moderating role of resource commitment. *Int. J. Inf. Manag. Sci.* **2016**, *6*, 1062–1074. [CrossRef]
- EuropeActive Releases Its New Information Paper on Innovation and Digitalisation in Europe. Available online: <http://www.europeactive.eu/news/europeactive-releases-its-new-information-paper-innovation-and-digitalisation-europe> (accessed on 6 September 2020).
- Annual Number of Global Mobile App Downloads 2016–2019–Statista Premium Account. Available online: <https://cheapstatista.work/annual-number-of-global-mobile-app-downloads-2016-2019/> (accessed on 9 September 2020).
- McKay, F.H.; Wright, A.; Shill, J.; Stephens, H.; Uccellini, M. Using health and well-being apps for behavior change: A systematic search and rating of apps. *JMIR mHealth uHealth* **2019**, *7*, e11926. [CrossRef] [PubMed]
- Digi-Sporting Guidelines on the Application of New Technologies, Professional Profiles, and Needs for the Digital Transformation of Sports Organisations. Available online: <https://digi-sporting.eu/outputs/> (accessed on 12 July 2020).
- Al-Htaybat, K.; Hutaibat, K.; von Alberti-Alhtaybat, L. Global brain-reflective accounting practices: Forms of intellectual capital contributing to value creation and sustainable development. *J. Intellect. Cap.* **2019**, *20*, 733–762. [CrossRef]
- Barney, J.B. Firm Resources and Sustained Competitive Advantage. *J. Manag.* **1991**, *17*, 99–120. [CrossRef]
- Eurostat. Available online: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20190430-1> (accessed on 20 September 2020).
- Bujacz, A.; Bernhard-Oettel, C.; Rigotti, T.; Lindfors, P. Task-level work engagement of self-employed and organizationally employed high-skilled workers. *Career Dev. Int.* **2017**, *22*, 724–738. [CrossRef]
- Warr, P.; Inceoglu, I. Work Orientations, Well-Being and Job Content of Self-Employed and Employed Professionals. *Work Employ. Soc.* **2018**, *32*, 292–311. [CrossRef]
- Hundley, G. Why and When Are the Self-Employed More Satisfied with Their Work? *Industrial Relations. Cambridge J. Reg. Econ. Soc.* **2001**, *40*, 293–316.
- Patzelt, H.; Shepherd, D.A. Recognizing Opportunities for Sustainable Development (July 2011). *Entrep. Theory Pract.* **2011**, *35*, 631–652. [CrossRef]
- Prottas, D. Do the self-employed value autonomy more than employees? Research across four samples. *Career Dev. Int.* **2008**, *13*, 33–45. [CrossRef]
- Millán, J.M.; Hessels, J.; Thurik, R.; Aguado, R. Determinants of Job Satisfaction: A European Comparison of Self-Employed and Paid Employees. *Small Bus. Econ.* **2013**, *40*, 651–670. [CrossRef]
- Gorgievski, M.J.; Bakker, A.B.; Schaufeli, W.B. Work engagement and workaholism: Comparing the self-employed and salaried employees. *J. Posit. Psychol.* **2010**, *5*, 83–96. [CrossRef]
- Albiol, J.; Diaz-Serrano, L.; Teruel, M. The Transition to Self-Employment and Perceived Skill-Mismatches: Panel Data Evidence from Eleven EU Countries. IZA Discussion Paper No. 13764. Available online: <https://ssrn.com/abstract=3704147> (accessed on 17 October 2020).

18. Porter, M.E. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, 3rd ed.; Free Press MacMillan Publish: New York, NY, USA, 1980.
19. Wernerfelt, B.A. Resource-Based View of the Firm. *Strateg. Manag. J.* **1984**, *5*, 171–180. [[CrossRef](#)]
20. Andrews, K. *The Concept of Corporate Strategy*; Dow Jones-Irwin: Homewood, CA, USA, 1971.
21. Penrose, E. *The Theory of the Growth of the Firm*; Wiley: New York, NY, USA, 1995.
22. Amit, R.; Schoemaker, P.J.H. Strategic assets and organizational rent. *Strateg. Manag. J.* **1993**, *14*, 33–46. [[CrossRef](#)]
23. Dierickx, I.; Cool, K. Asset Stock Accumulation and Sustainability of Competitive Advantage. *Manag. Sci.* **1989**, *35*, 1504–1511. [[CrossRef](#)]
24. Porter, M.E. *Ventaja Competitiva: Creación y Sostenibilidad de un Rendimiento Superior*; Free Press: New York, NY, USA, 1985.
25. Cuervo, A. La dirección estratégica de la empresa. Reflexiones desde la economía de la empresa. *Pap. Econ. Esp.* **1995**, *78*, 34–55.
26. Barney, J.B. Is the Resource-Based “View” a Useful Perspective for Strategic Management Research? Yes. *Acad. Manag. Rev.* **2001**, *26*, 41.
27. López-Rodríguez, J. *Análisis de la Actividad Exportadora de la Empresa: Una Aproximación Desde la Teoría de Recursos y Capacidades*; Universidad A Coruña: A Coruña, Spain, 2004.
28. Zhang, M.; Brodke, M.; McCullough, J. Cross-cultural reliability and validity of a scale to measure information technology capability. *J. Technol. Res.* **2010**, *2*, 1–20.
29. Fraser, S.; Wresch, W. National competitive advantage in e-commerce efforts: A report from five Caribbean nations. *Perspect. Glob. Dev. Technol.* **2005**, *4*, 27–44.
30. Rantala, T.; Ukko, J.; Saunila, M.; Havukainen, J. The effect of sustainability in the adoption of technological, service, and business model innovations. *J. Clean Prod.* **2018**, *172*, 46–55. [[CrossRef](#)]
31. Gago, D.; Rubalcaba, L. Innovation and ICT in service firms: Towards a multidimensional approach for impact assessment. *J. Evol. Econ.* **2007**, *17*, 25–44. [[CrossRef](#)]
32. Lu, Y.; Ramamurthy, K. Understanding the link between information technology capability and organizational agility: An empirical examination. *MIS Q. Manag. Inf. Syst.* **2011**, *35*, 931–954. [[CrossRef](#)]
33. Sambamurthy, V.; Zmud, R.W. At the heart of success: Organizational wide management competencies. In *Steps to the Future: Fresh Thinking on the Management of IT-Based Organizational Transformation*; Jossey-Bass: San Francisco, CA, USA, 1997; pp. 143–163.
34. Ketata, I.; Sofka, W.; Grimpe, C. Internal capabilities and firms’ environment. *R&D Manag.* **2015**, *45*, 60–75.
35. Delone, W.H.; Mclean, E.R. Information Systems Success: The Quest for the Dependent Variable. *J. Manag. Inf. Syst.* **1992**, *5*, 60–95. [[CrossRef](#)]
36. Emery, J.C. Cost/benefit analysis of information systems. *Soc. Manag. Inf. Syst.* **1971**, *10*, 1.
37. Rodríguez, M.T.; Peña, J.I. Capacity measurement on companies’ information technologies. *Rev. Rsc. Adm. Neg.* **2012**, *52*, 50–75.
38. Wang, Y.; Lo, H.; Zhang, Q.; Xue, Y. How technological capability influences business performance. *J. Technol. Manag. China* **2006**, *1*, 27–52. [[CrossRef](#)]
39. Erosa-Martín, V.E.; Arroyo-López, P.E. Segmentation of small firms based on information technology usage and absorptive capabilities. In *Proceedings of the Technology Management for Global Economic Growth*, Phuket, Thailand, 18–22 July 2010; pp. 1–8.
40. Alves, H.; Cepeda-Carrión, I.; Ortega-Gutiérrez, J.; Edvarsoon, B. The role of intellectual capital in fostering SD-Oriented and firm performance. *J. Intellect. Cap.* **2020**. [[CrossRef](#)]
41. Alavi, M.; Leidner, D.E. Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Q. Manag. Inf. Syst.* **2001**, *25*, 107–136. [[CrossRef](#)]
42. Cepeda-Carrión, I.; Ortega-Gutiérrez, J. The co-creation of value, and its influence on business results in sports centres. *Cuad. Psicol. Deport.* **2020**, *20*, 130–146.
43. Huysman, M.; Wulf, V. IT to Support Knowledge Sharing in Communities, towards a Social Capital Analysis. *J. Inf. Technol.* **2006**, *21*, 40–51. [[CrossRef](#)]
44. Lee, S.M.; Hong, S. An enterprise-wide knowledge management system infrastructure. *Ind. Manag. Data Syst.* **2002**, *102*, 17–25. [[CrossRef](#)]

45. Li, E.Y.; Chen, J.S.; Huang, Y.H. A framework for investigating the impact of IT capability and organisational capability on firm performance in the late industrialising context. *Int. J. Technol. Manag.* **2006**, *36*, 209. [CrossRef]
46. Liang, T.P.; You, J.J.; Liu, C.C. A resource-based perspective on information technology and firm performance: A meta analysis. *Ind. Manag. Data Syst.* **2010**, *110*, 1138–1158. [CrossRef]
47. Lyu, J.J.; Yan, Y.W.; Li, S.C. The relationship among information technology, innovation and firm performance—An empirical study of business services in SMEs. In Proceedings of the IEEM 2009—IEEE International Conference on Industrial Engineering and Engineering Management, Hong Kong, 8–11 December 2009; pp. 1258–1262.
48. Mithas, S.; Ramasubbu, N.; Sambamurthy, V. How Information Management Capability Influences Firm Performance. *MIS Q. Manag. Inf. Syst.* **2011**, *35*, 237–256. [CrossRef]
49. Nakata, C.; Zhu, Z.; Kraimer, M.L. The complex contribution of information technology capability to business performance. *J. Manag. Issues* **2008**, *20*, 485–506.
50. Sánchez-Rodríguez, C.; Martínez-Lorente, A.R. Effect of IT and quality management on performance. *Ind. Manag. Data Syst.* **2011**, *111*, 830–848. [CrossRef]
51. Pérez-López, S.; Alegre, J. Information technology competency, knowledge processes and firm performance. *Ind. Manag. Data Syst.* **2012**, *112*, 644–662. [CrossRef]
52. Ynzunza-Cortés, C.B.; Izar-Landeta, J.M.; Ávila-Acosta, R. Cultura organizacional, gestión de conocimiento y desempeño laboral. *Hitos Cienc. Econ. Adm.* **2013**, *19*, 77–86.
53. Schäfferling, A. Determinants and Consequences of IT Capability: Review and Synthesis of the Literature. In Proceedings of the 21st European Conference on Information Systems, Utrecht, The Netherlands, 5–8 June 2013; pp. 1–13. Available online: http://aisel.aisnet.org/ecis2013_cr/31 (accessed on 13 September 2020).
54. Bharadwaj, A.S. A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Q. Manag. Inf. Syst.* **2000**, *24*, 169–193. [CrossRef]
55. Carr, N.G. IT Doesn't Matter With Letters to the Editor. *Harv. Bus. Rev.* **2003**, *1*, 41–49.
56. Chae, H.C.; Koh, C.E.; Park, K.O. Information technology capability and firm performance: Role of industry. *Inf. Manag.* **2018**, *55*, 525–546. [CrossRef]
57. Clemons, E.K.; Row, M.C. Sustaining IT advantage: The role of structural differences. *MIS Q. Manag. Inf. Syst.* **1991**, *15*, 275–292. [CrossRef]
58. Jiao, H.; Chang, I.C.; Lu, Y. The relationship on Information technology capability and performance: An empirical research In the context of China's Yangtze river delta region. In Proceedings of the 2008 IEEE International Conference on Industrial Engineering and Engineering Management, Singapore, 8–11 December 2008; pp. 872–876.
59. Powell, T.C.; Dent-Micallef, A. Information Technology as Competitive Advantage: The Role of Human, Business, and Technology Resources. *Strateg. Manag. J.* **1997**, *18*, 375–405. [CrossRef]
60. Santhanam, R.; Hartono, E. Issues in linking information technology capability to firm performance. *MIS Q. Manag. Inf. Syst.* **2003**, *27*, 125–153. [CrossRef]
61. Wade, M.; Hulland, J. Review: The resource-based view and information systems research: Review, extension, and suggestions for future research. *MIS Q. Manag. Inf. Syst.* **2004**, *28*, 107–142. [CrossRef]
62. Ravichandran, T.; Lertwongsatien, C. Impact of Information Systems Resources and Capabilities on Firm Performance: A Resource-Based Perspective. *J. Manag. Inf. Syst.* **2002**, *107*, 166–182.
63. Karimi, J.; Somers, T.M.; Gupta, Y.P. Impact of information technology management practices on customer service. *J. Manag. Inf. Syst.* **2001**, *17*, 125–158. [CrossRef]
64. Correa, M.L.; Díaz, B.H. Information technologies capacities and organizational performance: A study of the Colombian context. *Innovar* **2018**, *28*, 99–116.
65. Prahalad, C.K. In Volatile Times, Agility. *Bus. Week* **2009**, 4147, 80.
66. Dove, R. *The Language, Structure, and Culture of the Agile Enterprise*; Wiley: New York, NY, USA, 2001.
67. Goldman, S.L.; Nagel, R.N.; Preiss, K. Agile competitors and virtual organizations. *Manuf. Rev.* **1995**, *8*, 59–67.
68. Sambamurthy, V.; Bharadwaj, A.; Grover, V. Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms. *Manag. Inf. Syst. Q.* **2003**, *27*, 237–263. [CrossRef]
69. Volberda, H.W. Toward the Flexible Form: How to Remain Vital in Hypercompetitive Environments. *Organ. Sci.* **1996**, *7*, 359–374. [CrossRef]

70. Balconi, M. Tacitness, codification of technological knowledge and the organisation of industry. *Res. Policy* **2002**, *31*, 357–379. [[CrossRef](#)]
71. DeCarolis, D.M. Competencies and Imitability in the Pharmaceutical Industry: An Analysis of Their Relationship with Firm Performance. *J. Manag.* **2003**, *29*, 27–50. [[CrossRef](#)]
72. Decarolis, D.M.; Deeds, D.L. The impact of stocks and flows of organizational knowledge on firm performance: An empirical investigation of the biotechnology industry. *Strateg. Manag. J.* **1999**, *20*, 953–968. [[CrossRef](#)]
73. Douglas, T.J.; Ryman, J.A. Understanding competitive advantage in the general hospital industry: Evaluating strategic competencies. *Strateg. Manag. J.* **2003**, *24*, 333–347. [[CrossRef](#)]
74. Figueiredo, P.N. Does technological learning pay off? Inter-firm differences in technological capability-accumulation paths and operational performance improvement. *Res. Policy* **2002**, *31*, 73–94. [[CrossRef](#)]
75. García, F.E.; Navas, J.E. Las capacidades tecnológicas y los resultados empresariales. Un estudio empírico en el sector biotecnológico español. *Cuad. Econ. Dir. Empres.* **2007**, *10*, 177–210. [[CrossRef](#)]
76. Nicholls-Nixon, C.L.; Woo, C.Y. Technology sourcing and output of established firms in a regime of encompassing technological change. *Strateg. Manag. J.* **2003**, *24*, 651–666. [[CrossRef](#)]
77. Ruiz-Jiménez, J.M.; Fuentes-Fuentes, M.D.M. Knowledge combination, innovation, organizational performance in technology firms. *Ind. Manag. Data Syst.* **2013**, *113*, 523–540. [[CrossRef](#)]
78. Zahra, S.A.; Nielsen, A.P. Sources of capabilities, integration and technology commercialization. *Strateg. Manag. J.* **2002**, *23*, 377–398. [[CrossRef](#)]
79. Bhatt, G.D.; Grover, V. Types of information technology capabilities and their role in competitive advantage: An empirical study. *J. Manag. Inf. Syst.* **2005**, *22*, 253–277. [[CrossRef](#)]
80. Mata, F.J.; Fuerst, W.L.; Barney, J.B. Information technology and sustained competitive advantage: A resource-based analysis. *MIS Q. Manag. Inf. Syst.* **1995**, *19*, 487–504. [[CrossRef](#)]
81. Ross, J.W.; Goodhue, D.L. Developing Long-term Competitiveness through Information Technology Assets. *Sloan Manag. Rev.* **1995**, *38*, 31–42.
82. Kohli, R.; Grover, V. Business value of IT: An essay on expanding research directions to keep up with the times. *J. Assoc. Inf. Syst.* **2008**, *9*, 23–39. [[CrossRef](#)]
83. Lucas, H.C.; Olson, M. The impact of information technology on organizational flexibility. *J. Organ. Comput.* **1994**, *4*, 155–176. [[CrossRef](#)]
84. Overby, E.; Bharadwaj, A.; Sambamurthy, V. Enterprise agility and the enabling role of information technology. *Eur. J. Inf. Syst.* **2006**, *15*, 120–131. [[CrossRef](#)]
85. Weill, P.D.; Subramani, M.D.; Broadbent, M. Building IT Infrastructure for Strategic Agility. *MIT Sloan Manag. Rev.* **2002**, *44*, 57–65.
86. Allen, B.R.; Boynton, A.C. Information architecture: In search of efficient flexibility. *MIS Q. Manag. Inf. Syst.* **1991**, *15*, 435–445. [[CrossRef](#)]
87. Galliers, R.D. Strategizing for Agility: Confronting Information Systems Inflexibility in Dynamic Environments. In *Agile Information Systems*; Kevin, C.D., Ed.; Routledge: Seattle, WA, USA, 2007.
88. Cepeda-Carrion, I.; Leal-Millán, A.G.; Martelo-Landroguez, S.; Leal-Rodriguez, A.L. Absorptive capacity and value in the banking industry: A multiple mediation model. *J. Bus. Res.* **2016**, *69*, 1644–1650. [[CrossRef](#)]
89. Teece, D.J. Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strateg. Manag. J.* **2007**, *28*, 1319–1350. [[CrossRef](#)]
90. Cepeda-Carrión, I.; Leal-Millán, A.G.; Ortega-Gutierrez, J.; Leal-Rodriguez, A.L. Linking unlearning with service quality through learning processes in the Spanish banking industry. *J. Bus. Res.* **2015**, *68*, 1450–1457. [[CrossRef](#)]
91. Bontis, N.; Dragonetti, N.C.; Jacobsen, K.; Roos, G. The knowledge toolbox: A review of the tools available to measure and manage intangible resources. *Eur. Manag. J.* **1999**, *17*, 391–402. [[CrossRef](#)]
92. Bontis, N.; Keow, W.C.C.; Richardson, S. Intellectual capital and business performance in Malaysian industries. *J. Intellect. Cap.* **2000**, *1*, 85–100. [[CrossRef](#)]
93. Chen, Y.; Wang, Y.; Nevo, S.; Jin, J.; Wang, L.; Chow, W.S. IT capability and organizational performance: The roles of business process agility and environmental factors. *Eur. J. Inf. Syst.* **2014**, *23*, 326–342. [[CrossRef](#)]
94. Khalique, M.; Bontis, N.; Abdul Nassir bin Shaari, J.; Hassan Md Isa, A. Intellectual capital in small and medium enterprises in Pakistan. *J. Intellect. Cap.* **2015**, *16*, 224–238. [[CrossRef](#)]

95. Marr, B.; Schiuma, G.; Neely, A. Intellectual capital—Defining key performance indicators for organizational knowledge assets. *Bus. Process Manag. J.* **2004**, *10*, 551–569. [[CrossRef](#)]
96. Nemkova, E. The impact of agility on the market performance of born-global firms: An exploratory study of the ‘Tech City’ innovation cluster. *J. Bus. Res.* **2017**, *80*, 257–265. [[CrossRef](#)]
97. Zhou, J.; Mavondo, F.T.; Saunders, S.G. The relationship between marketing agility and financial performance under different levels of market turbulence. *Ind. Market. Manag.* **2019**, *83*, 31–41. [[CrossRef](#)]
98. Goldman, M.M. Post-crisis sports marketing business model shifts. *Manag. Glob. Transit.* **2011**, *9*, 171–184.
99. Batra, D. The Impact of the COVID-19 on Organizational and Information Systems Agility. *Inform. Syst. Manag.* **2020**, *37*, 361–365. [[CrossRef](#)]
100. Queiroz, M.; Tallon, P.P.; Sharma, R.; Coltman, T. The role of IT application orchestration capability in improving agility and performance. *J. Strateg. Inf. Syst.* **2018**, *27*, 4–21. [[CrossRef](#)]
101. Sirmon, D.G.; Hitt, M.A.; Ireland, R.D. Managing firm resources in dynamic environments to create value: Looking inside the black box. *Acad. Manag. Rev.* **2007**, *32*, 273–292. [[CrossRef](#)]
102. Roberts, N.; Grover, V. Investigating firm’s customer agility and firm performance: The importance of aligning sense and respond capabilities. *J. Bus. Res.* **2012**, *65*, 579–585. [[CrossRef](#)]
103. Tallon, P.P.; Pinsonneault, A. Competing perspectives on the link between strategic information technology alignment and organizational agility: Insights from a mediation model. *MIS Q. Manag. Inf. Syst.* **2011**, *35*, 463–486. [[CrossRef](#)]
104. Skok, W.; Kophamel, A.; Richardson, I. Diagnosing information systems success: Importance-performance maps in the health club industry. *Inf. Manag.* **2001**, *38*, 409–419. [[CrossRef](#)]
105. Hoe, S.L. Issues and procedures in adopting SEM technique. *J. Appl. Quant. Methods* **2008**, *3*, 76–83.
106. Bentler, P.; Chou, C. Practical issues in structural modeling. *Sociol. Method. Res.* **1986**, *16*, 78–117. [[CrossRef](#)]
107. Worthington, R.; Whittaker, T. Scale development research. A content analysis and recommendations for best practices. *Couns. Psychol.* **2006**, *34*, 806–838. [[CrossRef](#)]
108. Anderson, J.C.; Gerbing, D.W. Some Methods for Respecifying Measurement Models to Obtain Unidimensional Construct Measurement. *J. Mark. Res.* **1982**, *19*, 453. [[CrossRef](#)]
109. Kline, R. *Principles and Practice of Structural Equation Modeling*, 2nd ed.; The Guilford Press: New York, NY, USA, 2005.
110. Hair, J.; Black, W.; Babin, B.; Anderson, R. *Multivariate Data Analysis*, 7th ed.; Pearson Education Limited: Edinburgh, UK, 2014.
111. Blunch, N.J. *Introduction to Structural Equation Modeling Using SPSS and AMOS*, 2nd ed.; SAGE Publications Ltd.: Thousand Oaks, CA, USA, 2008.
112. Arbuckle, J.L. *AMOS 17 User’s Guide, SPSS*; SPSS Inc.: Chicago, IL, USA, 2008.
113. Byrne, B.M. Structural Equation Modeling With AMOS, EQS, and LISREL: Comparative Approaches to Testing for the Factorial Validity of a Measuring Instrument. *Int. J. Test.* **2001**, *1*, 55–86. [[CrossRef](#)]
114. Hu, L.T.; Bentler, P.M. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model.* **1999**, *6*, 1–55. [[CrossRef](#)]
115. Bagozzi, R.P.; Yi, Y. On the evaluation of structural equation models. *J. Acad. Mark. Sci.* **1988**, *16*, 74–94. [[CrossRef](#)]
116. Fornell, C.; Larcker, D.F. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *J. Mark. Res.* **1981**, *18*, 39–50. [[CrossRef](#)]
117. Finney, S.J.; DiStefano, C. Non-normal and Categorical Data in Structural Equation Modelling. In *Structural Equation Modeling: A Second Course*; Hancock, G.R., Mueller, R.O., Eds.; IAP: Greenwich, CT, USA, 2006; pp. 269–314.
118. Aulawi, H.; Sudirman, I.; Suryadi, K.; Govindaraju, R. Knowledge sharing behavior, antecedent and its influence towards the company’s innovation capability. In Proceedings of the 2008 IEEE International Conference on Industrial Engineering and Engineering Management, Singapore, 8–11 December 2008; pp. 2092–2096.
119. Melville, N.; Kraemer, K.; Gurbaxani, V. Review: Information technology and organizational performance: An integrative model of it business value. *MIS Q. Manag. Inf. Syst.* **2004**, *28*, 283–322. [[CrossRef](#)]
120. Crocitto, M.; Youssef, M. The human side of organizational agility. *Ind. Manag. Data Syst.* **2003**, *103*, 388–397. [[CrossRef](#)]
121. Chelladurai, P. *Managing Organizations for Sport and Physical Activity*; Routledge: Abingdon, UK, 2014.

122. Papadopoulos, T.; Baltas, K.N.; Balta, M.E. The use of digital technologies by small and medium enterprises during COVID-19: Implications for theory and practice. *Int. J. Inform. Manag.* **2020**, *55*, 1–4. [[CrossRef](#)]
123. Ulrich, D.; Yeung, A. Agility: The new response to dynamic change. *Strateg. HR Rev.* **2019**, *18*, 161–167. [[CrossRef](#)]
124. Chou, C.Y.; Huang, C.H.; Lin, T.A. Organizational intellectual capital and its relation to frontline service employee innovative behavior: Consumer value co-creation behavior as a moderator. *Serv. Bus.* **2018**, *12*, 663–684. [[CrossRef](#)]
125. Kim, Y.J.; Song, S.; Sambamurthy, V.; Lee, Y.L. Entrepreneurship, knowledge integration capability, and firm performance: An empirical study. *Inf. Syst. Front.* **2012**, *14*, 1047–1060. [[CrossRef](#)]
126. Zakery, A.; Afrazeh, A. Intellectual capital based performance improvement, study in insurance firms. *J. Intellect. Cap.* **2015**, *16*, 619–638. [[CrossRef](#)]
127. Madhavaram, S.; Hunt, S.D. Customizing business-to-business (B2B) professional services: The role of intellectual capital and internal social capital. *J. Bus. Res.* **2017**, *74*, 38–46. [[CrossRef](#)]
128. Bonazzi, F.L.Z.; Meirelles, D.S. Intellectual capital and value creation: An analysis from the business model theory within a process approach. *Int. J. Learn. Intellect. Cap.* **2017**, *14*, 109–134. [[CrossRef](#)]
129. Buenechea-Elberdin, M.; Kianto, A.; Saenz, J. The Moderating Role of Servitization Degree in the IC-Innovation Linkage. In Proceedings of the 8th European Conference on Knowledge Management, Barcelona, Spain, 6–7 September 2007; pp. 171–180.
130. Fan, I.Y.H.; Lee, R.W.B. Intellectual capital-based innovation planning: Empirical studies using wiNK model. *J. Intellect. Cap.* **2016**, *17*, 553–569. [[CrossRef](#)]
131. Hussinki, H.; Ritala, P.; Vanhala, M.; Kianto, A. Intellectual capital, knowledge management practices and firm performance. *J. Intellect. Cap.* **2017**, *18*, 904–922. [[CrossRef](#)]
132. Kourosh, V.; Kozechian, H.; Ehsani, M.; Kashtidar, M. Modeling the relationship between organizational agility and organizational performance in sport manufacturing firms. In Proceedings of the 8th International Congress on Physical Education and Sport Sciences, Tehran, Iran, 17–19 February 2014; pp. 19–20. Available online: <https://www.sid.ir/en/journal/ViewPaper.aspx?id=595276> (accessed on 20 September 2020).
133. Ratten, V. Coronavirus (covid-19) and entrepreneurship: Changing life and work landscape. *J. Small Bus. Entrep.* **2020**, *32*, 503–516. [[CrossRef](#)]

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