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Examining the Relationship between Digital Trust and Consumer Loyalty in the Israeli Telecommunications Services Market

Ph.D. dissertation

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The economic relevance and purpose of the research

Modern information societies have an increasingly strong digital culture. Although the change started nearly 50 years ago, the explosion of digital culture has been triggered and continues to be fuelled by the rapid spread of broadband internet and digital imaging. The COVID-19 pandemic has changed a number of familiar processes and put them in a completely new light. In particular, the role of telecom companies in the life of society has increased, as they provide not only communication and data transmission, but also the possibility for teleworking, communication, free time and education. The efficient operation of telecommunication companies enables other organisations to operate efficiently, as their success depends to a large extent on their level of digitalisation. The real world and the digital (virtual) environment are interconnected at numerous points through the intermediary medium, i.e. digital platforms.

By taking advantage of technological convergence, cable operators have increasingly become full-service entertainment and telecom providers, competing on ever-increasing bandwidth, making multimedia offerings more diverse and more widely available. With the proliferation of "Over The Top" (OTT) services, the traditional form of telecommunications has been pushed into the background and competition has intensified. Previously secure 'triple-play' (broadband or cable, telephone, TV) packages from telecoms companies are under threat from the growth of OTT players and their resulting significant popularity. The availability of popular international channels is further eroding the traditional dominance of telecom operators and the distribution of content by bringing it directly to consumers through their own mobile and smart TV apps (Netflix, HBO, etc.). The economic relevance of consumer loyalty in the market of mobile phone services is driven not only by the market entry of wholesale and virtual operators, but also by the rapid spread of the 5G mobile network, which has opened up significant market opportunities and driven market restructuring. As a result of Israel's 5G bid, the opportunity for a revolutionary new technological shift in Israel was created, which is spreading globally, and for Israel to enter this novel network, which represents a major technological breakthrough compared to the current system. However, the fifth-generation network presents not only benefits but also significant challenges: the incumbent fixed (even fibre-optic cable) network operator faces the problem of mobile internet being much faster and ubiquitous, even on the move, thus eliminating dependence on fixed infrastructure providers.

The emergence of this new technology and the restructuring of the market in an already saturated and highly competitive market make the value of consumer loyalty particularly valuable. Organisations that previously provided only mobile communications telecom services have almost completely transformed their operations through digital transformation and are now confidently providing high-speed mobile internet and digital television to the public. Market saturation and market challenges are forcing incumbent (traditional) network service providers to reassess the scope and value of their services. Maintaining and possibly increasing their market position can only be achieved at the expense of existing operators, i.e. by attracting customers from other operators and by increasing and maintaining the loyalty of existing customers. In this respect, it is essential to assess consumer satisfaction with the services provided by telecommunications companies and to identify and analyse the factors affecting consumer loyalty.

I have been living in Israel since the late 90s and working in various positions in leading telecommunications companies and IT departments. Due to my job and my commitment to technology, I have been at the centre of IT change and have been involved in the transformation of the telecommunications infrastructure not only as an observer or user, but also as an active

implementer and sometimes a decision-maker. Heraclitus himself noted: “Change is the only constant,” but we are also witnessing the world changing at an unprecedented speed and scale. Technology is advancing at an unprecedented pace – the spread of digital culture is the fastest technological expansion in human history – driven primarily by exponential improvements in computing power, storage capacity and global connectivity, and virtually changing our culture at a fundamental level.

Despite considerable academic interest, the digital transformation, even today, and even more so with the convergence of infrastructure and the impact of the Covid pandemic, still poses a number of questions for which there are no precise answers. In addition, a number of theoretical and practical aspects of my research area remain underdeveloped – it is not known how transformation takes place at the strategic level, at the organisational level, at the process level and at the technology level.

This paper fills this gap to a large extent, which determines its practical importance in defining the whys. Since digital maturity models are not well developed in terms of the telecom industry, I have examined the telecommunications industry and within it the incumbent companies, using a holistic analytical approach.

The aim of my thesis, which can also be considered as the aim of my practical work, is to review the models that traditional telecommunication companies can use to assess their digital maturity and to identify the most important elements, and to examine the influence of digital trust on consumer loyalty by examining consumer loyalty and its determining factors, with a special focus on consumer satisfaction and consumer trust and their interrelationship from the perspective of consumer loyalty.

The topicality and economic importance of consumer loyalty in the turbulent storm of digital transformation in Israel’s saturated telecommunications market and technological developments provided the basis for the choice of topic, purpose and research design. In addition, my deep knowledge of the Israeli telecommunications market and the organisations operating in it also had a significant impact on the topic of my research. This thesis was therefore designed to provide a comprehensive picture of consumer satisfaction, consumer trust and consumer loyalty in a digital environment, while taking into account the level of digital maturity of companies and its impact. The industry context for the study is the Israeli mobile and fixed telecommunications services market, where the saturation of the market particularly highlights the importance of consumer loyalty. My research is focused on the functioning of traditional telecommunications, mobile and fixed-line service providers, the changes in their services, their digital transformation and their adaptation to the permanently changing market environment.

In my view as a practising manager, the importance of consumer loyalty, understanding its antecedents and measuring its impact is one of the key elements of market survival for traditional telecom companies. The process of digital transformation and the methodological need to apply it strategically is something I feel in my daily work.

Structure of the dissertation

The introduction and the chapters on the economic relevance and objectives of the research are followed by a literature review and an overview of the Israeli telecommunications sector. Chapter 4 presents the research methodology and research design, followed by a description and the results of the qualitative research in Chapter 5, based on which a comparative analysis of digital maturity models is conducted in Chapter 6, taking into account and confirming the qualitative research results. Chapter 7 examines the impact of digital trust on consumer loyalty by extending the ECSI model. Chapter 8 is the conclusions and recommendations chapter. The paper concludes with a bibliography and appendices. Together

with the bibliography and the annexes, the thesis is comprised of a total of 182 pages. The bibliography consists of 26 pages.

Literature review

This dissertation focuses on incumbent telecommunications companies, with a particular focus on Israeli telecommunications companies. The research questions focus on two aspects of service provision in the online medium during digital transformation: on the one hand, online actors lack sufficient knowledge about the service provider and the quality of the service, which leads to uncertainty in their decisions, and on the other hand, how a service provider can reduce the uncertainty of consumers in the online medium, thereby increasing the consumer's digital trust and strengthening the consumer's loyalty to their service. The hypothesis-testing model aims to simulate the effects of these uncertainties and the impact of digital trust on consumer loyalty. Based on three research questions, the paper investigates four hypotheses and specifies a model.

My first research question focuses on Israeli incumbent telecommunications companies. Managing digital transformation efforts is not a simple task for incumbents and transformation involves significant organisational changes, considering new business models, creating new digital solutions, and developing the skills needed to innovate. Digital transformation is therefore a challenge for incumbents. The first research question is whether the digital transformation models proposed in the literature are applicable to incumbent telecoms companies. In examining this research question, it is particularly interesting to address the issues of trust and corporate integrity in the digital environment when retaining or acquiring customers.

The motivation behind the second research question is whether the existing digital maturity models are suitable for measuring the digital maturity of incumbent telecoms companies and to what level they express the maturity and level of digital trust. A comparative analysis of the digital maturity models is presented in Chapter 6.

The third research question was motivated by the previously observed phenomenon of the extent to which digital trust influences consumer loyalty in the digital transformation, in a digital environment. The intuition behind the investigation of this question is that digital trust in an online environment has a significant impact on consumer loyalty, which is based on data security, data management, data transparency and the ease of use of the online interface. Based on this hypothesis, and within the framework of the extended European Consumer Satisfaction Index (ECSI) model described in Chapter 7, this dissertation investigates the justifiability of the following hypotheses.

Research hypotheses

Hypothesis 1

Digital trust in a digital service context shows a direct positive correlation with all aspects of consumer loyalty and is a significant antecedent of consumer loyalty.

This hypothesis can be broken down into three parts according to the dimensions of digital trust, based on which:

H1a	There is a positive correlation between the security of consumer data provided by the service provider and digital trust in the digital environment**.**
H1b	There is a positive correlation between privacy provided by the service provider and digital trust in a digital environment.

H1c	There is a positive correlation between digital trust provided by the service provider and consumer loyalty in a digital environment.

Satisfaction and digital trust have a mutual effect on consumer loyalty, and I assume that trust has a greater effect on loyalty than satisfaction in a digital environment. Thus, trust is a stronger direct indicator of customer loyalty than satisfaction. Based on these findings, I defined my second hypothesis, which states:

Hypothesis 2

Digital trust in a digital service context shows a direct positive correlation with consumer loyalty and this correlation is stronger than the direct effect of consumer satisfaction on consumer loyalty.

Trust leads to commitment and, through this, loyalty, which translates into positive behaviour and purchase intentions. When consumers trust a brand, they are more likely to have positive purchase intentions. A corporate image is a profile of the organisation, which is all the impressions and expectations that are built up in the minds of individuals about the company. In a digital environment, the value attributes of a corporate image include authenticity, honesty, responsibility and integrity, which shape a sense of trust, reliability and the sense of belonging. The more positive the generalised image of a company is to consumers, the more likely consumers are to adopt and use the digital services provided by the company with confidence. Based on this, I formulated my third hypothesis:

Hypothesis 3

Brand image in a digital services context has a stronger effect on consumer loyalty through digital trust as a mediator than the direct effect of brand image on consumer loyalty.

The hypothesis can be divided into three parts according to the relationships and dimensions of brand image, based on which:

H3a	Brand image in a digital service context has a positive, direct impact on trust in the service provider.
H3b	Brand image in a digital service context has a positive correlation to consumer loyalty through the mediation of digital trust as a variable, and thus has an indirect effect on consumer loyalty.
H3c	Brand image in a digital service context has a direct positive correlation with consumer loyalty.

To have trust in a brand, consumers must have a positive perception of quality and also believe that it will stay positive in the future. If the performance attributed to a service provider is of low quality and/or below expectations, it is likely to reduce consumer trust in the competence of the service provider. Alternatively, when consumers perceive that access to the service is user-friendly, it is easy to use, and that data usage is transparent and their data is secure, this will reinforce and increase their trust in the service provider. Perceived quality has a positive impact on the consumer's perceived trust and can therefore be seen as a precondition for consumer confidence. In a digital environment, perceived quality of service has a positive impact on the creation of trust and reliability towards the service provider, i.e. quality of service

in a digital environment is an important factor in building consumer trust. On this basis, I have defined my fourth hypothesis:

Hypothesis 4

Perceived quality in a digital service context shows a direct positive correlation with digital trust and this correlation is stronger than the direct impact of perceived quality on consumer satisfaction.

This hypothesis can be divided into three parts according to the relationships between the perceived quality. Thus:

H4a	Perceived quality in a digital service context has a direct positive correlation with consumer satisfaction.
H4b	Perceived quality in a digital service context has a positive, direct impact on trust in the service provider.
H4c	Perceived quality in a digital service context has a stronger impact on trust in the service provider than on consumer satisfaction.

Research methods

First, I examined the operating environment of the telecommunications market in Israel, where I then tested the consumer loyalty model I had set up. In my thesis, I did this by conducting in-depth interviews among Israeli telecommunications and industry professionals on senior and middle manager level. Once knowledge of the external environment is in place, it is also important to determine the parameters of the internal environment for the industry concerned, which I did by comparative analysis of digital maturity models and their components. The results of the in-depth interview research were compared with the analytical results of existing models, which provided the basis for the inclusion of digital trust in the consumer loyalty model.

The impact of digital trust on consumer loyalty was assessed by extending the European Consumer Satisfaction Index (ECSI) model. I tested the extended model by means of an online questionnaire survey and analysed the results using a partial least squares structural equation model (a.k.a. PLS path modelling).

Concise description of the study carried out, chapter by chapter

Within the framework of this paper, I have limited the research to a single holistic unit of analysis – the Telecommunication Service Provider (TSP) industry. I have deliberately chosen the industry for the subject of analysis, taking into account the technological innovations and disruptive phenomena, as well as the digital maturity of this industry.

I conducted the research in three phases:

1) In-depth interviews – Chapter 5 In order to explore the existence and characteristics of digital transformation, digital maturity and digital trust in the Israeli telecommunications sector, I conducted interviews with middle and senior managers and industry professionals. In the in-depth interviews, I tried to formulate limited and achievable goals. I merely wanted to reveal the phenomenon of how traditional telecommunications companies are experiencing digital transformation and what characteristics are important for the successful implementation of this

transformation. In addition to the existence of the digital transformation process, I also wanted to find out its qualitative parameters – digital maturity and digital trust. The latter results provided the basis for my primary research.

2) Literature research, comparative analysis (Comparative analysis of digital maturity models) – Chapter 6 My aim is to systematise, examine and comparatively analyse the literature on existing major digital maturity models and to identify their common dimensions. In doing so, I have explored the background of digital maturity models and examined whether there is a digital maturity model that is directly applicable to the telecommunications sector. By comparing the models, I identified the common dimensions and their parameters. My aim is to identify the dimensions of a model suitable and tailored for telecom operators and to develop a proposal based on the literature analysis and the results of the in-depth interviews.
3) Questionnaire survey (An empirical investigation of the relationship between digital trust and consumer loyalty) – Chapter 7 My aim was to investigate the impact of digital trust as a latent variable on consumer loyalty in digital environments by extending the widely used European Consumer Satisfaction Index (ECSI) model. Drawing on similar research in the literature and the results of in-depth interviews, as well as considering the defining dimensions of digital maturity models, I developed a research model and measurement tool to prove the hypotheses I have developed and based on the literature.

In-depth interviews (Chapter 5)

In this research, I consider **digital transformation** *as a permanent process to achieve digital maturity* (Kane et al., 2017), *which changes the traditional strategy, including business processes, structure, value creation and financial aspects, as well as human capital and culture* (Hess et al., 2016; Kane et al., 2017).

For my research, I used the digital transformation framework proposed by Matt et al. (2015), which identifies three dimensions for achieving the intended goals of digital technology:

1) changes in value creation,
2) structural changes and
3) financial aspects.

In order to explore the existence and characteristics of digital transformation, digital maturity and digital trust in the Israeli telecommunications sector, I conducted interviews with middle and senior managers and industry professionals.

In the in-depth interviews, I tried to formulate limited and achievable goals. I merely wanted to reveal the phenomenon of how traditional telecommunications companies are experiencing digital transformation, what characteristics are important for the successful implementation of this transformation, and how well the digital transformation framework by Matt et al. (2015) fits with the digital transformation of Israeli incumbents. In addition to the existence of the digital transformation process, I also wanted to find out its qualitative parameters – digital maturity and digital trust. The latter results provided the basis for my primary research.

I conducted eight semi-structured interviews with former and current CEOs and Chief Information Officers, both via online video calls (Zoom and Teams) amidst the COVID-19 pandemic and face-to-face (F2F) meetings. The interviews took place between February and April 2021 and lasted an average of 50 minutes. The questions asked in the semi-structured

interviews were aimed at exploring the digital transformation and its antecedents as well as future plans. The main topics covered were the following:

1) defining digital transformation and digital maturity;
2) the forces and challenges affecting the industry and the company;
3) digital transformation as an opportunity or a threat;
4) the skills needed for successful digital transformation; and
5) a description of the relevant digital cultural aspects that a company needs in its digital transformation.

First, I conducted interviews with middle managers to observe their reactions, validate the questions and gain experience with the technique used. The initial interviews with middle managers were followed by interviews with industry experts and executives from incumbent telecom companies. After the interviews, I prepared a short summary and extract of the main findings.

For the method of interviews and data analysis, I chose the four-step analytical approach proposed by Wilson (Wilson, 2014). Therefore, the analysis started after the first interviews. After the interviews, I transcribed the data from the video files or notes into digital format. Following the Gioia methodology, I classified the interview transcripts using open coding (Gioia et al., 2013) based on the following groups (coding framework) (the semi-structured interview questions and relevant codes are contained in Table 17 in Appendix 3 of this paper):

(A) Transformation process;
(B) Structural changes;
(C) Digital strategy;
(D) Financial aspects;
(E) Exploiting technology;
(F) Value chain, ecosystem change;
(G) General questions.

In the Israeli market, telecoms industry revenue, based on the annual accounts of the four largest players in the market (HOT Group data taken from Altice's consolidated balance sheet data), amounted to NIS 19.44 billion (approx. USD 6 billion at 31 December 2020 exchange rates) in 2020, a decrease of approximately 1.35% compared to 2019. The Hot group was the only one to show a slight increase, while all four large companies were affected by the impact of the coronavirus on the mobile sector due to a decline in revenues from tourism. The coronavirus crisis has led to growth in the fixed (cable) sector due to the development of the fibre optic network and the high demand for increased internet usage on the one hand and a decline in mobile revenues on the other, mainly due to the lack of international roaming revenues and fierce competition. Over the last decade, the industry has undergone a number of business model innovations due to industry competition and the challenges of new digital entrants.

The results of the interviews show that incumbents face a significant challenge in approaching these phases in parallel under the pressures of digital disruption and disruptive innovation effects. Based on the analysis of the interviews, it can be stated that, in general, incumbent telecom operators are trying to digitally transform their businesses in parallel with the digitisation and digitalisation phases. Thus, the telecom industry is striving to digitize a significant part of the customer experience while also digitizing and automating its internal competencies and business processes.

One of the common denominators in the digital transformation of companies is to maintain market share and long-term competitive position. The Israeli telecoms industry, as we can tell from the interviews, sees the need to develop its digital offerings to ensure a solid competitive position in the future.

According to Matt et al. (2015), financial considerations are both drivers and inhibitors of digital transformation, and all interviewees agreed and highlighted the financial aspects of any change. Note that the incumbents acknowledge the existence of a macro trend of disruption and opportunity driven by digital technology and the need for rapid action and response. These actions do not always yield positive financial results, but fierce competition often requires the company to be part of the market by providing the product, service or functionality that users need.

When asked, "What are the main factors holding back the progress of digital transformation in your company or in your industry, i.e. telecommunications?" data security and privacy were clearly and almost unanimously mentioned. The inhibitors of digital transformation, namely the pressing issues of data protection, data use and data storage, were raised by all interviewees. They all agreed that trust in the organisation is highly dependent on the level of transparency and security of data management provided by the service provider.

The interviewees' privacy concerns about the progress of digital transformation are in line with the results of the 2018 Dell Technologies survey (Bourne & Dell Technologies, 2018). Dell asked 4,600 senior executives about the inhibiting factors of digital transformation: "What are the main barriers to achieving digital transformation within your organization?" The results of the responses also put fears about data protection and data security at the top of the list.

The role of digital technology as a key driver of transformation is also prevalent and widely accepted by incumbent service providers. Incumbent service providers have realised two things. First, digital technologies, such as artificial intelligence, big data, blockchain, etc., often mentioned in the literature, are very important for transforming operational processes but also for transforming business strategy. Second, digital transformation is much more comprehensive than the increased use of technology and that all organisational dimensions need to be aligned in a homogeneous strategy. The telecommunications services industry shares similar characteristics with the media industry analysed by Matt et al. (2015). Matt et al. (2015) note that changes in the value creation dimension of a company in the digital transformation framework are strongly related to the dynamics of the industry to which it is linked and are often not comparable with other sectors. The core business of telecom operators – the classic offering: TV, telephone – is gradually moving towards mass services.

Based on the above, my qualitative research results confirm the applicability of the multidimensional digital transformation framework theory developed by Matt et al. (2015), which I used as the basis for this research, to incumbent telecoms companies. Corporate integrity, especially transparency and security of stored and collected personal user data, access to and use of the data, occupy a significant place among Israeli telecom service providers. Based on the Israeli example, it can be said that in the digital environment, consumer trust, including ***digital trust***, is a significant part of corporate strategy.

Comparative analysis of digital maturity models (Chapter 6)

Digital maturity is linked to digital transformation. Digital transformation is about leveraging digital technologies and improving and enhancing business processes, corporate culture and customer experiences to improve efficiency, performance and outcomes, where a key element of digital transformation is achieving increased business agility; the ability to adapt quickly to changing business and market requirements. Matt et al. (2015) have set up the framework of digital transformation and defined its dimensions, but for organisations on the way towards transformation, an indicator is essential to assess the current state and determine the next strategic steps. Digital maturity is not just about having a lot of devices, but also about having the right devices to work with and for the organisation to be able to maximise these to achieve its specific goals, i.e. being able to act proactively and effectively in the context of a

digital competitive environment. This requires a thorough understanding of where the organisation is digitally as a business, where it wants to go and what needs to happen to get there.

As part of this paper, a comparative analysis of digital maturity models was conducted, primarily to identify and examine the dimensions of variables that influence consumer loyalty in the digital environment. On the one hand, my aim was to gain insight into the methods used to assess the level of digital maturity in organisations, to compare the dimensions and parameters of the models; to identify common dimensions suitable for measuring digital maturity based on the models; to examine whether there is an industry-specific maturity model applicable to the telecommunications industry. On the other, by comparing the dimensions of the digital maturity models with the results of the in-depth interviews, the existence of digital trust as a dimension or factor in measuring digital maturity and its relationship with consumer loyalty had to be investigated.

For my comparative analysis, I relied on a review of the digital maturity models conducted by Chanias and Hess (2016), updated the analysed models and added additional digital maturity models. I focused only on literature that provides methodologies for assessing the maturity of companies based on digital criteria and tools with an adequate level of description that allows for classification and has a sound theoretical or experimental basis. For the analysis, I also considered the comprehensive analysis of Bumann and Peter (2019) (Bumann & Peter, 2019), which I used as a basis for further illumination of the final study sample for the comparative analysis.

The result is a list of 24 studies that formed the basis for the comparative analysis. I grouped the digital maturity models in the comparative analysis according to different categories. Particular attention was paid to the model's approach – whether it is a general model or focuses on a specific industry or area. I have also highlighted the parameters of the model: the areas of study of the maturity level of the model; the number of dimensions; the number of maturity levels; and the number of measurement parameters. I categorised the models under study into two groups according to my approach:

- A category following a linear maturity approach, which assumes a linear evolutionary path for organisations pursuing digital transformation efforts. It implies that each phase or maturity level can only be reached through linear achievement of the dimensions.
- The category of non-linear digital maturity models that takes a general model approach has no dependency or sequence relationship between the levels of the different dimensions.

I have also divided the models according to the way in which the measurement analysis is carried out – whether the organisation can carry out the analysis on its own, under its own authority, or whether it can only be carried out by a third party, e.g. a consultancy firm, to determine the maturity level. I have categorised separately the nature of the source of the research models – whether they involve models produced by consultants and practitioners or are the result of academic research. A list of the digital maturity models examined and the characteristics mentioned are presented in Appendix 4, Table 18.

Since the 24 digital maturity models contain 129 maturity dimensions, 41 of which are identical or similar, but 84 dimensions have very different and unique names, this made comparison impossible. In order to better understand the meaning of the dimensions, I examined their more detailed characteristics and definitions in the different models. This allowed me to identify the most frequently occurring maturity dimensions and to group the original 129 dimensions into common aggregate dimensions. Of course, I was also able to group

a dimension into more than one common group, as the dimensions and their descriptions and characteristics of the models sometimes covered more than one maturity domain.

The research results show that most models provide an incomplete picture of digital maturity and that maturity indicators are not comparable across and within industries. Nevertheless, their application can be done mainly through a third-party consultant. The maturity level is only suitable for a mapping of the current state. It does not provide tangible and applicable specific steps and a programme plan for reaching further – a higher level of – maturity. Furthermore, the review shows that most digital maturity models examined are related to the industrial/manufacturing and processing area. Other areas, such as services and telecommunications, are clearly under-represented. Particular attention has been paid to the role of digital trust components – security, transparency, data management and use, privacy and data retention – in the digital transformation and how this is reflected in digital maturity models.

It has been confirmed that the characteristics of digital security that enhance digital transformation efforts are not systematically embedded or do not show dominance in contemporary digital maturity models.

Overall, based on the results of my comparison of the maturity models, I can conclude that research in this area is still not extensive and that future research should pay more attention to:

1. the development of digital maturity models that are relevant to the service area and take into account its specific aspects; and
2. the components of digital trust should be systematically integrated into digital maturity models.

An empirical investigation of the relationship between digital trust and consumer loyalty (Chapter 7)

Previous studies in the literature have tested the ECSI model on several occasions. In several cases, an extended model was used to provide a better and broader explanation of loyalty. Trust as a latent variable has been included as an additional latent variable in several empirical studies in the literature. This paper investigated the topic of trust in online environments and its antecedents and thus included digital trust as a latent variable in the basic model. In line with my hypothesis, I extended the original ECSI model by three components of digital trust – security, privacy and digital trust. In the extended model, corporate image and perceived quality are (through the aspect of digital trust) indirectly related to the investigated factor of consumer loyalty. The extended complete model consists of an internal structural model and a measurement model, and includes ten latent variables. It should be noted that the two indicators of digital trust were originally in the construct of perceived quality, but have been transferred to the construct of digital trust in the extended model. These changes are justified by the components of digital trust and the characteristics of the online ecosystem, and the model test results generally confirm this change.

By reviewing the topics of consumer satisfaction, trust and loyalty and formulating hypotheses about the relationships between them, I developed the theoretical framework within which the final empirical research and its analysis were carried out. The data collection investigates attitudes in the online environment and their impact in terms of loyalty and satisfaction.

An exciting comparison can be made by comparing the test results of the basic ECSI model and the ECSI model extended with digital trust as a latent variable. Does digital trust affect loyalty and to what extent does it explain loyalty attitudes in the online environment?

The research model extended with digital trust as a latent variable is shown in Figure 1, indicating the hypotheses, the empirical testing of which and the results analysed are presented in Chapter 7 of this paper. The hypotheses formulated are also indicated by a thicker arrow in the figure for ease of reference.

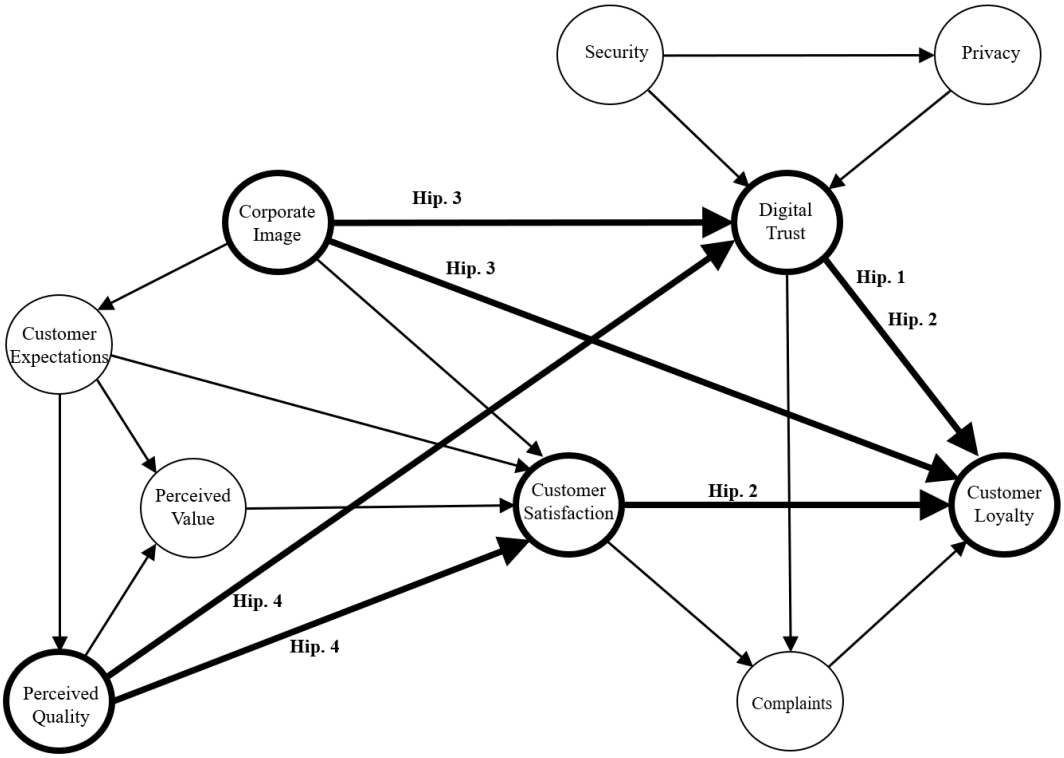

Figure 1. The research model, its relationships and the signals of the hypotheses. Source: authors' own editing

In my quantitative research, I used CAWI (Computer Assisted Web Interview) to test the impact and mediating role of digital trust on consumer loyalty in the Israeli market, in the research model I had set up. The sub-population selected included individuals with TV and mobile subscriptions who received the online questionnaire using the snowball method.

Based on the preliminary data, I examined the construction of the model and the effect of the manifest variables and their fit to the model. The discriminant validity of some of the variables was questionable and the feedback from the respondents confirmed this as well. Based on the results received, the feedback and the model check, I deleted and changed some questions, while I also restructured the questionnaire. Finally, I also dropped some of the manifest variables as a result of the discriminant validity test. The final model, an extended version of the basic ECSI model, thus contains 10 (ten) latent variables and 34 (thirty-four) manifest variables.

The final online survey took place between 15 and 30 May 2021. The questionnaire was sent to 120 people and thanks to the forwarding, a total of 670 people partially completed the questionnaire, of which 597 completed it in full. After cleaning the data, the sample size for further analysis was 505.

The survey included 190 women (37.6%) and 315 men (62.4%). This means that in terms of gender ratio, men are in the majority in the sample, which is significantly different from the national population, where 50.19% are women and 49.81% are men. The age of the respondents ranged mainly between 24 and 55 years (89.2%).

In terms of age, 75 respondents (14.9%) were in the 18–23 age group, 200 (39.6%) in the 24–39 age group, 175 (34.6%) in the 40–55 age group and 45 (8.9%) in the 55–75 age group. Only 10 (2%) of the 75+ age group completed the questionnaire. The sample predominantly included respondents from the 24–55 age group (74.2%).

In addition to demographic issues, due to the topic, the distribution of mobile phone service providers in the research sample was also important. The distribution of respondents in the sample strongly approximates the market share of each operator at the time of sampling – 180 (36%) were HOT customers, 195 (39%) were YES customers, while 180 (36%) were Partner telecoms customers. The percentage for each provider exceeds 100% due to the possibility of indicating more than one provider in the response.

The vast majority of respondents – 338 (76.9%) – had a single subscription, while 167 (23.1%) had more than one. 75.2% of respondents had an Internet subscription, while 71.3% had a TV subscription. For mobile subscriptions, 19.8% of respondents had a 5G service subscription.

For each provider, the duration of the customer-provider relationship was between 1 and 3 years, representing 57% of all respondents. It can be seen that the relatively short duration of the provider-consumer relationship is the result of fierce market competition and the negligible deterrent effect of switching costs. 18% of the respondents had been customers of the same supplier for at least 3 years, and 15% for more than 5 years.

To evaluate the results, I used SmartPLS version 3.0 (Ringle et al., 2015) and performed the PLS analysis. The strength of PLS path modelling is its suitability for prediction-oriented research. The main feature considered by researchers is that it produces results for latent variables measured by one or a few indicators (manifest variables). It eliminates the problems arising from small samples and can, therefore, be used in situations where other methods cannot. It can estimate very complex models with many latent and manifest variables. It has less stringent assumptions on the distribution and errors of variables. It can handle both reflective and formative measurement models. However, the use of PLS also requires caution, as it is no less stringent on sample representativeness. PLS path modelling does not provide a global indicator of goodness of fit. The traditional criterion for internal consistency is Cronbach's Alpha, which provides an estimate of liability based on the correlation between indicators. While Cronbach's Alpha assumes that all indicators are equally reliable, PLS ranks indicators according to their reliability, resulting in a more reliable composite. Composite reliability takes into account the different weights (loadings) of indicators and can be interpreted in the same way as Cronbach's Alpha (Henseler et al., 2009).

I used PLS-SEM to estimate both the original ECSI model and the ECSI model extended with digital confidence. I used SmartPLS version 3.3 (Ringle et al., 2015) to evaluate the results. As a first step, I tested the results with 300 iterations, which showed that each of the questions tested had a high correlation with the given constructs of the model. Then, I used bootstrapping to test the significance of the relationships in the model by generating 5,000 random sub-samples to ensure that the appropriate standard errors were estimated (Chin, 1998). The PLS method has been successfully applied in the field of telecommunications by several previous foreign researchers (Aydin & Özer, 2005; Coelho & Henseler, 2012; Turel & Serenko, 2006) to detect and model relationships between survey items.

Testing the model and the relationships within it was also a way of testing the hypotheses that had been formulated earlier.

The external model was tested for reliability and validity, based on composition reliability, convergence validity and discriminant validity. The internal (structural) model describes the relationships between latent variables. Its evaluation includes checking collinearity problems between variables, checking the relevance and significance of relationships between variables (the path coefficients), determining the coefficient of determination and determining effect sizes. The results of the reflective measurement evaluation and the structural model evaluation are presented in the tables of Appendix 7. The model test results meet all relevant criteria.

In the extended model, consumer loyalty is significantly affected by consumer satisfaction. However, digital trust does not show a significant effect on loyalty, but the inclusion of this variable in the model better explains consumer loyalty to the service provider. Consumer expectation has been found to significantly increase and affect consumer expectations of quality and value of service ($f^{2=}$ 1.473; $f^{2=}$ 0.200). Corporate image itself has a direct and significant effect on prior expectations ($f^{2=}$ 0.726), while security significantly increases consumer trust in privacy ($f^{2=}$ 1.965).

Research findings

The results presented from the model analysis show that the extended ECSI model has higher explanatory power for consumer loyalty. In the telecom sector, loyalty in the extended ECSI model has an R^2 value of 73.6 percent, an increase of 1.0 percentage point compared to the baseline model. This is a precise indication that the inclusion of the new construct in the model – digital trust – shows a higher potential for an increase in explanatory power. The R^2 for digital trust as a latent variable in the model is 0.82, which means that the model can explain 82.0 percent of the variance in digital trust in the Israeli telecommunications sector. This explanatory power is considered significant in the research field.

All the points of my first hypothesis are fulfilled, so

H1a	There is a positive correlation between the security of consumer data provided by the service provider and digital trust in the digital environment**.**
H1b	There is a positive correlation between privacy provided by the service provider and digital trust in a digital environment.
H1c	There is a positive correlation between digital trust provided by the service provider and consumer loyalty in a digital environment.

Based on these findings, it can be stated that the first hypothesis of this thesis is fulfilled, i.e. *digital trust in a digital service context shows a direct positive correlation with all aspects of consumer loyalty and is a significant antecedent of consumer loyalty.*

The results lead us to formulate the following thesis.

Thesis 1

Digital trust has a significant impact on consumer loyalty in a digital environment and taking it into account when measuring loyalty provides higher explanatory power.

In the model, consumer satisfaction has a direct impact on two latent constructs: consumer loyalty and complaint handling. The effect of satisfaction on complaint handling is significantly reduced in the extended model (from 0.297 to 0.045). This suggests that consumer satisfaction has a neutral effect on complaint handling in a digital environment. The direct effect

of satisfaction on loyalty is 0.560 in the basic ECSI model, while the direct effect value is 0.420 in the extended model.

Satisfaction remains one of the most important variables in explaining loyalty, with a total effect coefficient of 0.420 in the extended ECSI model and 0.560 in the base model. However, it can be observed that digital trust has an important effect on consumer loyalty in the extended ECSI model, which is the third strongest overall effect (0.349) in the model, after corporate image and consumer satisfaction. While consumer expectation and perceived quality have a significant effect in explaining consumer loyalty in digital online environments, it is worth noting that the effect from digital trust is significantly larger than the effect from expectation or perceived quality. The antecedents of perceived value, complaint handling and digital trust (security and privacy) have smaller (but significant) effects on loyalty. Note that the effect of the proposed construct (digital trust) is close to that of satisfaction, indicating that digital trust is as important as satisfaction and corporate image in explaining loyalty in a digital environment.

On the basis of the above, it can be stated that, with the assumptions discussed above, the **second hypothesis** of this dissertation **is not fulfilled**, i.e. *although digital trust in a digital service context has a direct positive correlation with consumer loyalty, the direct effect of consumer satisfaction is stronger.* However, the results show that it has a significant impact on consumer loyalty in addition to satisfaction. Thus, the following thesis can be formulated.

Thesis 2

Digital trust, alongside consumer satisfaction, is an important component and antecedent of consumer loyalty in a digital environment.

Corporate image directly affects three basic latent constructs in the model:

1. consumer expectations,
2. consumer satisfaction and
3. consumer loyalty.

The effect of corporate image on expectations (0.581 and 0.580) and consumer satisfaction (0.338 and 0.387) is virtually unchanged when comparing the baseline and research models (extended ECSI model). However, also in the extended ECSI model, corporate image shows the largest overall effect (0.548) in explaining consumer satisfaction. In the base model, this effect is 0.588. It can be observed that in digital environments and in the ECSI model extended by adding digital trust, the role and the estimated overall effect of corporate image increases in the relationship with consumer satisfaction.

In the extended ECSI model, the direct effect of corporate image on consumer loyalty is significantly reduced from 0.361 in the base model to 0.198. However, it still indirectly influences loyalty through consumer satisfaction and digital trust (total indirect effect of corporate image – consumer loyalty: 0.488). Table 40 in Appendix 7 shows the relationships and values of the indirect effects.

In the extended ECSI model, the effects of corporate image and security are the most significant on digital trust (0.372 and 0.466), while the effects of privacy and perceived quality are relatively small but significant (0.150 and 0.252) in the telecom sector, indicating that trust is mainly driven by data security and protection and corporate reputation (image).

Similar to the ECSI model, in the extended model, corporate image has a significant effect, while consumer expectations and perceived quality have a major effect in explaining consumer loyalty in digital online environments. Compared to the base model, the indirect effect of corporate image, through digital trust as a mediator, has a stronger effect on consumer loyalty than directly.

Based on the above, it can be stated that, with the assumptions discussed above, the **third hypothesis of** this dissertation **is fulfilled**, i.e. *brand image in a digital service context has a stronger impact on consumer loyalty through digital trust as a mediator than directly.* Thus, the following thesis can be formulated.

Thesis 3

In a digital environment, brand image, combined with digital trust, has a stronger impact on consumer loyalty than brand image alone, so digital trust and brand image together have a significant impact on consumer loyalty.

Perceived quality has a direct impact on perceived value and consumer satisfaction. Comparing the estimates of the two models, it can be seen that the impact of quality on satisfaction remained unchanged, while the impact of quality on value increased. The fact that the estimated impact of quality on consumer satisfaction remained unchanged suggests that some of the indicators of quality are related to and directly explain digital trust. An interesting finding in the extended model is the significant effect of perceived quality on digital trust (0.252). This is particularly noticeable in online, digital environments, as the quality of the digital platforms, sales interfaces, consumer applications, ease of use and transparency of data management provided by the service provider have a significant impact on the trust component in the consumer's choice and decision process. This finding is supported by literature (Mastercard, 2017).

This result confirms the positive relationship between quality and digital trust – sub-hypothesis **H4b** of the fourth hypothesis group is thus accepted.

The effect of perceived quality on satisfaction is 0.257, while in the basic ECSI model the effect is 0.210. Thus, we can say that quality has an effect on consumer satisfaction just as it has on trust in the service provider. This result confirms the positive relationship between quality and consumer satisfaction – sub-hypothesis **H4a** of the fourth hypothesis group is thus accepted. Since sub-hypothesis **H4c** is not fulfilled – perceived quality has a stronger effect on digital trust than on consumer satisfaction – the fourth hypothesis is only partially fulfilled, i.e. we cannot accept it.

On the basis of the above, it can be stated that, with the assumptions discussed above, the **fourth hypothesis** of this dissertation is **not fulfilled**, i.e. *although perceived quality in a digital service context has a direct positive correlation with digital trust, this correlation is weaker than the direct effect of perceived quality on consumer satisfaction.* Nevertheless, the significant positive effect of perceived quality on digital trust allows us to formulate the following thesis.

Thesis 4

In a digital environment, the quality, ease of use and transparency of the digital platforms, sales interfaces and consumer applications provided by the service provider have a significant impact on the trust component, digital trust in the company, in the consumer's choice and decision-making process.

Final conclusions

In conclusion, I can state that the study has achieved the objectives of the research and theoretically underpinned the key dimensions of the digital maturity assessment of incumbent telecoms companies, and strengthened the explanation of consumer loyalty in the digital environment through digital trust by extending the ECSI model.

The research explores the links between digital trust and consumer loyalty for consumers of telecom services in the proposed model. For telecoms companies, it is important to capitalise on consumer trust, which plays an increasingly important role in the digital environment.

4. In the present research, I agree with Kane et al.'s (2017) definition of digital transformation as a permanent process to achieve digital maturity, a process that changes traditional strategy, including business processes, structure, value creation, financial aspects as well as human capital and culture.
5. Based on the digital transformation framework of Matt et al. (2015), I believe that the digital transformation model is a model of organisational structure – culture – governance transformation. This transformation can be primarily delivered through the adoption and application of digital technologies, which provide opportunities for the creation of agile and integrated business models, new and disruptive services. The drivers of this transformation are primarily changes in consumers and their expectations, but it is also driven or forced by technological innovation, disruptive actions by competitors and other external factors.
6. The role and strong correlations of digital trust in the telecom sector can be observed in the analysis of relationships when examining loyalty in a digital environment. Digital trust has a significant role in the positive attitudinal and preferential aspect of consumer loyalty. Thus, it can be said that higher levels of digital trust increase consumer loyalty and also lead to a more favourable perception of the service provider. This research result also confirms the findings in the literature (IBM Corporation, 2017; Martin, 2018; Metehan & Yasemin, 2011; Rodriguez et al., 2020; Wong et al., 2019).
7. In the model developed in this paper (extended ECSI model), four parameters influence digital trust: security, privacy, perceived quality and brand image. Consumers need to be sure that their data is protected from unauthorised use and that the service provider is doing everything possible to keep their data secure. Consumers should be given control and choice over the type of information they share with the service provider, who has access to their information and how it is used (KPMG, 2016). It is important to inform consumers of the advantages they can enjoy when their personal data is used and that it is not only for the benefit of the service provider. Also, they must know who can be held responsible at the company in case of a breach and where they can lodge a complaint (Mastercard, 2017; Pulay, 2021b).
8. Based on the literature, I assumed that perceived quality (Arcand et al., 2017; Chaudhry et al., 2016; Clauss et al., 2018) and corporate image have a significant positive impact on digital trust. Based on the survey results, I found that in a digital environment, user-friendliness, compelling and seamless usability, tangibility (navigation, content, ease of use, aesthetics, etc.), and customer-centric approach are important dimensions of perceived quality that positively influence digital trust. This finding is in line with the results of previous studies (Arcand et al., 2017; Chaudhry et al., 2016; Clauss et al., 2018), which suggest that these dimensions can positively influence consumer satisfaction and the adoption of digital services. The results of this research suggest that telecom service consumers have trust, commitment and loyalty towards telecom service providers when they provide strong customer and technical support services that are prompt and accessible.
9. In the digital environment, consumers expect empathy, care, understanding, interactive fairness, personalised and convenient communication (social portals, instant messaging, SMS, email or telephone contact) and personalisation of service from service providers.

10. In agreement with the literature (Abraham et al., 2019; Accenture, 2016; IBM Corporation, 2017; PwC, 2021), I hypothesised that security and privacy have a significant positive impact on digital trust. I found that transparency, responsible use of data, integrity, and a customer-centric approach are important dimensions of security and privacy that positively affect digital trust. In addition, consumers are more likely to stay with their current provider if the provider is able to provide these dimensions. In addition, another important aspect is that digital trust can be seen as a complementary and decisive indicator of loyalty because, although switching providers in a digital environment is easy and quick, there is a high degree of uncertainty about the potential disappointment of new services. Thus, digital trust also mitigated the role of other factors perceived by consumers as disturbing their satisfaction and they were more likely to remain loyal to the service provider rather than switching to a service they did not trust. Thus, loyalty was more likely to be the result of an attachment to a company or brand, in this case digital trust.

The ranking of satisfaction with the consumer-service provider relationship and consumer trust in the service provider cannot be decided on their own, as they have a significant direct and indirect impact on each other. The results of the present study are therefore not in themselves suitable to clearly determine the existence of an order of relationship between consumer satisfaction and digital trust in telecom operators, even for the market under study. In interpreting the results, this order can therefore be postulated rather from the strength of the impact on each dimension of consumer loyalty. On this basis, it seems more likely that consumer satisfaction has an impact on consumer loyalty through digital trust.

Obviously, loyalty can be explained relatively well by the constructs of the basic ECSI model, but in a digital context, by adding the latent construct of digital trust (security – privacy – digital trust), it can be explained even better by the extended model. Without these additional constructs, loyalty is explained primarily by satisfaction, quality and corporate image. This study has attempted to integrate online trust and online loyalty in a digital environment by extending the basic ECSI model by adding a latent variable of digital trust. This model focuses on the antecedents perceived by consumers that help to build trust and loyalty. In the case of the extended model, loyalty can be explained by a new construct of digital trust and significant inferences can be drawn in the online, digital environment between the level of digital trust provided by the service provider and the strength of loyalty. The results can be explained by the unique characteristics of the highly competitive telecommunications sector and reinforce the view that loyalty only pays off with strategies that value long-term customers and thereby build trust towards new customers.

Digital trust is an outcome that can be influenced, but not controlled. Trust in digital services increases consumer loyalty, opens up new relationships and significant untapped opportunities. The research confirms that consumers are increasingly sensitive about sharing their personal data and expect a higher-value service in return for sharing their personal data with their service provider.

Security is not a limiting factor or a constraint to satisfy expectations, but a real value creator and a competitive advantage when properly integrated. Embedded in business thinking and planning, risk-based, integrated and working as strategic partners, cybersecurity teams are an integral part of a company's success. The findings of my research are also confirmed by PwC's Digital TrustInsights survey (PwC, 2021). Building digital trust is essential for business, but it requires a top-level and comprehensive strategy to make it truly part of the organisation.

Usability of new scientific results and recommendations

The impact of the COVID-19 pandemic and the uncertain environment have further accelerated the digital transformation and continue to reduce the number of physical shops. Achieving confidence in cybersecurity is one of the greatest challenges of the digital age. The scope and responsibility are multifaceted: they equally depend on governments, regulatory authorities, suppliers (producers), telecom network operators (service providers) and end users. If the vital element of the digital economy is data, then at its heart is digital trust – the level of confidence in people, processes and technology.

The results of the research also raised a number of practical implications:

1. Involving security experts from the early stages of digital transformation: most of the respondents to my interviews with Israeli business leaders explained that they include security and privacy officers and experts as stakeholders in the design of new service developments, business processes, and even include proactive management of cyber and privacy risks in project plans and budgets.

2. Continuous training for professionals and managers: without the right level of professional and practical knowledge and experience, managing security, privacy and integrity risks is becoming much more difficult and unprofessional. It is important to designate the right person to fill key roles such as Chief Information Security Officer (CISO), Chief Security Officer (CSO), Chief Digital Officer (CDO), etc.

3. Proactivity in compliance: developing the compliance function and integrity management with a focus on values. According to respondents, the biggest digital compliance and ethics challenges worldwide are

a) knowledge of the latest regulatory developments;
b) compliance with the regulations in force; and
c) preparing for future regulation.

4. Greater attention to the dimensions of customer centricity, security and empathy.

5. Definition of a data protection strategy at company level based on the following dimensions:

a) *protection*: policies and procedures to protect consumers' personal data.
b) *transparency*: be transparent about how and why we collect, use, store and delete consumers' personal data.
c) *use*: providing consumers with simple and secure tools to manage and control the use of their personal data.

6. Developing and implementing uniform authentication standards: Uniform authentication standards increase trust, enabling digital ecosystems to take root and grow. Governments, standardisation bodies, telecoms operators and infrastructure providers should work together to develop standards that enable society to put politics aside, embrace transparency and move towards common goals through trusted digital systems.

With 5G mobile communications technology, access to data on consumer behaviour and greater consumer trust in telecommunications companies, there is a real opportunity for incumbent telecoms operators to become the leading new-age digital service providers and digital infrastructure providers. Incumbent telecom companies already have all the ingredients to deliver the new-age expectations: technology, network, speed, connectivity, data security, which they can leverage and combine into their corporate strategy.

In addition to diversifying their business portfolio and opening up new revenue streams, these services will allow incumbent telecoms companies to remain competitive and, perhaps with a bit of optimism, even build a new digital future for themselves, fostering sustainable growth in today's interconnected world.

Limitations of research

The results of this paper are subject to the following limitations. The research and the results refer to the Israeli telecommunication services industry, i.e. the correlations found in this paper are valid for this country and this industry. Without conducting further research and testing the relationships, the results may not be valid for other service industries, especially non-service industries, and the results obtained here cannot be applied to other industries.

The research was conducted among Israeli telecommunications executives and the population using Israeli communications services. Therefore, the results are relevant to this population. Extending the results to other populations, or in particular to international populations in other countries, will only be possible on the basis of further research and testing of the correlations. Such studies would also allow for international comparisons of the results in the group of questions examined. In my analysis, I have also indicated in the research method section that the scientific character of the questionnaire data collection method may be argued. *This research is descriptive and does not involve a probability sample, and applies only to and is valid only for the sample in question.* Surveys of this kind have their limitations, *so it is only valid for the 505 people I interviewed in the questionnaire.* The research examined the subjective opinions of the respondents, and this was processed using statistical methods. The questionnaire sampling on which this thesis is based does not involve probability sampling, so the probability of selection cannot be accurately quantified, and therefore any conclusions drawn from the sample should be treated with reservations. In the case of the snowball method used, biases due to the nature of the method must be taken into account. However, as a "preliminary study" it is very suitable to provide a starting point for further research or even controlled experiments in the future (KSH, 2020).

Interpretation of the results is also limited by the fact that the study used single cross-sectional sampling, so the correlations now found may change over time. In subsequent cross-sectional studies, it is possible that different results from the present one will be obtained. Longitudinal studies are needed to explore the dynamics of the relationships and to make international comparisons.

This paper is based on a holistic and comprehensive scientific research, which I have carried out independently in accordance with the aim and objectives. I have personally developed and carried out the novel scientific provisions submitted for the defence of the thesis, as well as the analyses, conclusions, calculations and recommendations contained in the paper.

The main modules and results of this dissertation research have been presented at international conferences and published in five scientific publications.

List of publications

Horváth, J. G. (2019). Об отдельных вопросах корпоративного обучения в Израиле, In: *БГПУ - Белорусский государственный педагогический университет имени Максима Танка* (76 old), Minszk, Fehéroroszország, ISBN: 9789855417843

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