

# Information Technology Competency Management in the Financial Sector in Latvia

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**Abstract**—Digital transformation is penetrating financial sector. Financial sector is challenged by new start-up companies who combine finance and technology, thereby creating disruptive innovations. The authors perform a study on information technology impact on competency management in the financial sector of Latvia based on the technology management competency model.

The authors have executed extensive academic literature review and interviews with leading fintech industry experts. The research team performed mixed research combining qualitative and quantitative methods. The process of the quantitative research was designed as a collection of publicly available financial statement data from *lursoft.lv* (enterprise database) for selected fintech companies and the analysis of financial data by comparing different fintech companies. The process of the qualitative research was designed as face-to-face expert interviews and the definition of central interview questions for the research based on the literature review and related sub-questions. The authors use the one-way analysis of variance technique and prove that competency management differs among fintech companies by comparing average turnover per employee of platform and credit companies. The finding persuades the authors to propose a fundamental fintech competency model to ensure competitiveness and sustainability of fintech companies. The objective of the research is to define a fundamental set of competencies linked with information technology management for financial sector companies to maintain competitiveness.

Results prove that current set of competencies employed by fintech companies represents sufficient technical competencies. The conclusions demonstrate that fintech companies tend to have different competency management models. The research team concludes that soft skills development, data analytics using advanced data analytic tools, technology awareness, the ability and experience to use open source technology tools to develop technology solutions without deep technology competency, the ability to see the big picture, and interconnections between processes are competencies of the future.

**Keywords**—Competency Management, Competency Model, Financial Sector, Information Technology

## I. INTRODUCTION

The authors perform a study on information technology impact on competency management in the financial sector of Latvia based on the technology management competency model [1]. According to academic publications, there is a problem of competency mismatch between labor market and requirements set by companies. The employment level remains low, reaching 60.5% in the second quarter of 2018 in the European Union [2], while companies attempt to recruit competencies. Companies are mostly focused on recruiting competencies of the past and present to achieve business goals. There is a debate in the academic literature that future competency needs are often neglected due to the lack of competencies in the labor market and the lack of decent competency management by companies.

Widely is discussed interaction between financial sector and technology innovations. Financial sector companies are looking to use technology solutions to establish innovative, asset light, scalable, competitive and sustainable business models. New finance and technology-based business models are knowledge intensive.

In the last ten years, the financial services sector is experiencing radical changes on a global scale. The outcome of this process is the very rapid development of financial technologies, or fintech industries, which have effectively managed to duplicate virtually the entire spectrum of financial services with IT solutions-based alternatives.

Fintech has developed itself as a separate segment of industries within the financial services sector of Latvia, directly affected by the “footprint” of digital transformation in this sector. By replacing the traditional for Latvia so called non-resident oriented financial services segment, fintech companies show a rapid capitalization, growth in turnover, an increase of customer numbers and a range of covered export markets.

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Although this segment of the financial services sector is characterized by heterogeneity in the business model (including in terms of competitiveness and sustainability), the common feature for all companies are high technology intensity and, very often, a high proportion of its own financial technology development activities.

In view of this exposure, it can be expected that it leads to structural changes in employment that may not be present. It is likely that it is not homogenous not only in the entire spectrum of financial services sector but also in the various fintech’s industries.

The objective of the research is to define a fundamental set of competencies for financial sector companies to maintain competitiveness. The authors of this study considered that competencies in the fintech industries are currently fully representing changes in skills and knowledge needs and, to a enough extent, the diversity of skills and knowledge requested for the financial services sector. Therefore, the fintech industries has been selected for the analysis of the situation in this study.

Null and alternative hypotheses were formulated on the basis of the problem statement and the objective of the research (Table I).

TABLE I. HYPOTESIS STATEMENT

Null Hypothesis	Alternative Hypothesis
$H_0$ : Competency management is equal among fintech companies	$H_1$ : Competency management is different among fintech companies

The authors of the research have identified that the impact of information technology on competency management in the financial sector of Latvia is relevant for the research. Latvia is ranked 37th among 137 countries with a positive tendency towards technological readiness with highly ranked technological adaption and availability of latest technologies according to the global competitiveness index 2017 – 2018. Over the past years, Latvia has had a negative trend in the financial market development index ranking (64th spot), which demonstrates negative tendencies in the availability and affordability of financial services [3].

The global competitiveness index and Ministry of Economics financial sector development goals show importance and urgency to understand competency management synergy between technology and financial sector development to improve the competitiveness of Latvia’s financial sector. The objective of the research is to define a fundamental set of competencies for financial sector companies to maintain competitiveness.

To reach the aim research team has applied 3 main data selection methods: extensive academic literature review and interviews with leading fintech industry experts, collection of publicly available financial statement data.

## II. MATERIALS AND METHODS

### A. Background of the Study

There are various extensive academic studies about information technology management competencies but a limited number of academic studies about finance management competencies change due to digital transformation [4], [5], but little evidence on the relationship between information technology management and finance management competencies.

In the context of this study, the authors recognize that recent academic studies refer to the increased importance of competency management and measurement models as key sustainability and competency factors for contemporary companies [6]. Financial sector changes with the growing number of new fintech companies. Business models are created on the basis of synergy between information technology management competencies and finance management competencies, bring companies to the point where it is no longer possible to achieve business goals only through existing competencies leverage, but completely new sets of competencies will be brought to companies [7].

Research team investigates academic publications on digital transformation, financial sector structural change and information technology impact on financial sector development. There are very few scientific researches on competency management with respect to fintech companies. The authors research competency management based on the technology management competency model proposed by Doggett, McGee and Scott [1]. Finally, research splits fintech companies into two types based on their business profiles and validates literature research results through leading fintech expert interviews.

The dataset of this study consists of expert interviews and financial statement data of fintech companies for 2016 and 2017. The empirical part of the work is done using last two-year data as most of the fintech companies were established in 2015. The authors introduce a variable to calculate the effectiveness of competency management for different fintech companies and tests differences between fintech companies using a one-way analysis of variance.

Finally, the authors propose a competency management model for fintech companies to address their future needs. The research team has noted that there exist different competency definitions offered in various academic studies. Competency is extensively defined as a performance aspect for the combination of skills, knowledge, expertise, values, social and methodical abilities, ambitions and attitudes that are used by individuals for personal growth to perform specific tasks in an effective manner and in line with values and goals of the organization [8]- [10].

Based on the definitions collected from literature sources, research team proposes to define individual competency and organizational level competence. Individual competency is a set of ambition, skills, knowledge and characteristics a self-driven individual

uses and is able to train to achieve personal effectiveness. Organizational level competence is a set of ambitions, skills, knowledge and characteristics owned by a company through employees, which measures and predicts employee effectiveness to achieve organizational goals.

Technology management competencies have been extensively researched by Doggett, McGee and Scott [1]. The authors propose a core technology management competency model linking process, project, systems and operations through the management context that refers to self-management, people management, quality management and risk management.

Financial sector digital transformation is one of the most expeditiously researched topics across academic publications during the last decade. The authors consider "financial sector" to be a category of overall economy consisting of a variety of organizations that provide financial services to individuals and businesses. Paper treats "fintech industry" as a specific business domain, which is part of financial sector.

### *B. Methods Applied*

Research performed mixed research combining qualitative and quantitative methods for exploring and understanding the defined problem statement.

Creswell [11], research team followed qualitative methodology. Following guideline steps recommended by research methodology:

developed a questionnaire based on literature review;

- collected data in the field on-site through face-to-face expert interviews in the premises where experts can be observed in their natural setting;
- gathered multiple forms of data and organized additional collected sources of data into categories to get a broader understanding;
- built patterns based on categories to establish a comprehensive set of themes and then look back at themes to understand if more evidence in the form of additional data needs to be collected to support identified themes;
- explained to the participants the research team background and experiences to design potential shaping of research team interpretation and direction of the study;
- reported to the participants multiple perspectives, factors and situations sketching a larger picture that emerges by representing the holistic approach of the qualitative research.

Quantitative research was based on financial statement data analysis. The process of the quantitative research was designed as the collection of publicly available financial statement data from *lursoft.lv* (enterprise database) for selected fintech companies and the analysis of financial data by comparing different fintech companies.

Sample selection. In the beginning of the research

identified ten fintech companies operating in Latvia for at least a 12-month period, which provided structurally different services like capital raising, payments, online credits and online auto leasing platform. Research team approached the CEO of each company to schedule interviews with CEOs, Heads of IT and Heads of HR. Fintech companies of different business types were selected to test awareness among different finance technology companies. Employees of different levels within the same company were selected for the expert interviews to test their awareness of the impact produced by information technology competency on the company's competitive position. Out of ten approached companies, six companies agreed to an expert interview. Out of six companies, two companies agreed to proceed with scheduled expert interviews for the CEO, Head of HR and Head of IT and four companies agreed to C-level expert interviews; as a result, in the research conducted nine expert interviews out of potential thirty expert interviews within the research: six C-level expert interviews, two expert interviews with Heads of IT and two expert interviews with Heads of HR.

Main research questions: (1) How do you evaluate current personnel competencies to succeed in new technology implementation in your company? (2) What competencies are lacking and what competencies are sufficient for candidates applying for positions in your company? (3) What competencies are needed to support future needs of your company?

Qualitative data analyses using content analysis but quantitative data analysis with statistical methods.

## III. RESULTS AND DISCUSSION

### *C. Interview results*

Current personnel competencies. All level experts agree that current personnel are missing big picture understanding. The experts emphasize the importance of fintech industry knowledge and self-learning ability.

The paper emphasizes that experts were extensively discussing that current personnel were missing big picture understanding. Research results proves that it is necessary to establish a communication and cooperation environment where technical teams could obtain domain knowledge from business teams and where business teams would be knowledgeable about latest technologies integrations into business processes. The research points out that big picture understanding can be obtained by establishing effective communication channels among business domains.

Competencies lacking for candidates applying for positions. All the experts share the same opinion that there are enough technically skilled and traditional specialists like financial analysts in Latvia. The credit fintech C-level experts point out that industry knowledge and experience are missing, but the platform fintech experts do not consider the lack of experience to be an



issue. The technical experts point out that technical people lack an understanding of product lifecycle and business. The credit fintech HR expert mentions that there is no knowledge of how to work with advanced data analytics using technology tools like SQL or R. The platform HR notes that critical thinking and analytical mind are missing competencies.

Research highlights that credit companies see competency gaps due to a complex business environment in which credit companies are operating. The paper points out that the opinion that there are enough competencies in the market to support platform fintech companies is due to the fact that the platform business environment has just started to develop. The paper discusses that there are fewer capital funds available for platform companies in comparison with credit companies, where the average net annual return for investors is 11.68% [12]. The research stresses that limited capital availability is decelerating the growth of platform companies, competitiveness is still low enough and, therefore, platform companies can operate with the current set of competencies. The paper emphasizes that increasing competitiveness in combination with the ambition to scale the business will motivate platform companies to employ new competencies. The research concludes that this would lead to platform companies requiring a set of competencies that would be similar to that of credit companies.

Competencies to support future needs of the companies. The credit fintech C-level experts admit that overall knowledge of all business domains, which is not limited to just one single niche, will be a key competency in the future. The credit and platform fintech experts believe that data analytics will be a future competency. The technical experts note that entrepreneurs who are able to use open source technical solutions to build new businesses are a future competency. HR experts see that the ability to work with speed and in a dynamic work environment will be important. The experts consider that mathematics, statistics and data analysis together with emotional intelligence will be a competency of the future.

The research results argue that DevOps approach has changed the technology department approach by merging development and infrastructure teams into one team. The authors notes that technology teams will merge with business teams. Results points out that there will be a joined competency set where technology people will understand business processes and business people will be able to use open source technology solutions to address business needs.

#### D. Financial data analysis

The authors perform financial data analysis to compare effectiveness of competency management by platform and credit fintech companies. The authors state that effective competency management leads companies to more effective operations and gives a competitive advantage. Most of the fintech companies have been operating in Latvia only starting from 2015; therefore,

the only available periods for the analysis are 2016 and 2017. To compare different business types and evaluate their competitiveness, the authors choose to measure effectiveness of the companies by calculating turnover per employee (Fig. 1).

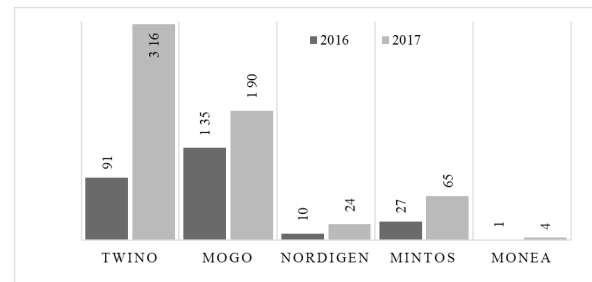


Fig. 1. Turnover per employee of platform-based companies, thousands EUR.

The research analyses the calculated results and evaluates which of the platform companies tend to improve effectiveness, and this can be related to different competency management models (Fig.2).

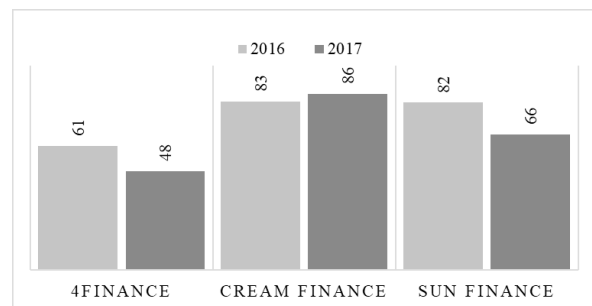


Fig. 2. Turnover per employee of credit-based companies, thousands EUR

Results points out that usually platform companies have an ecosystem that is much simpler than that of credit companies. During the expert interviews, researchers have noticed that the HR function of the platform companies is typically managed by CEO and there is no legal department, while credit companies have set up all the competencies. Research team have discussed insource or outsource competencies with the experts. All the experts agree that all core competencies will be insourced as intellectual capital will belong to the company. In the case of fintech companies, missing competencies outsourcing can be regarded as a short-term solution and not a strategic decision to maintain exceptional performance. Although knowledge-intensive fintech companies focusing on insource core competencies, fintech companies do not maintain databases of represented competencies and utilized skills, do not analyse competency gaps and do not monitor future needs. Moreover, there is little awareness about returns on investments in human capital, and the optimal structure of employed competencies that would identify overemployment points and productivity effectiveness is not analysed.

#### E. Competence model

As a result of the expert interviews, the paper summarizes the identified competencies (Table II) based on the technology management competencies model proposed by [1]. Moreover, the experts point out that

technical people lack business knowledge and business people need to have awareness about technical processes.

TABLE II. COMPETENCY MANAGEMENT MODEL

		Main Elements			
		Process	Project	Systems	Operation
sub elements	Self-Management	People Management	Quality Management	Risk Management	
	Ambition Communication Self-training and development	Emotional intelligence Minimum viable product understanding Technology awareness	Sustainable system development UX analysis	Monitoring and measurement Data analysis Credit risk management Compliance	

### F. Hypotesis testing

To quantify the formulated hypothesis, the researchers selected the same sample of fintech companies as used for qualitative research for hypothesis testing and divided the selected fintech companies into platform and credit companies and calculated changes in turnover per one employee based on audited financial statement data for the financial years 2016 and 2017. Selected the one-way analysis of variance (abbreviated ANOVA) technique to test the formulated hypothesis. The ANOVA is a statistics technique based on an independent random sample to compare means between one or more populations [13].

Through hypothesis testing, the research seeks to compare average turnover per one employee yields between platform and credit companies, for which purpose data from the samples are summarized by their means and the research assumes that  $\mu_1$  and  $\mu_2$  are means corresponding to population and considers testing  $H_0$  (1) against  $H_1$  (2).

It is assumed under the null hypothesis that both group means are equal and that there is no difference between platform and credit companies (1).

$$H_0: \mu_1 = \mu_2 \quad (1)$$

where  $\mu$  is the mean value of the selected groups.

Under the alternative hypothesis, it is assumed that both group means are not equal and there is no equality between platform and credit companies (2).

$$H_1: \mu_1 \neq \mu_2 \quad (2)$$

Research considers relying on three assumptions to test results if there is a difference between two industries:

- 1) Both population variances are equal;
- 2) Responses for both groups are sampled independently;
- 3) Response variable residuals are normally distributed.

To execute the defined assumptions and related calculations for hypothesis testing, the research has used R Studio and performed the following steps:

- 1) Installed and loaded R packages ‘plyr’, ‘magrittr’, ‘dplyr’ and ‘readxl’ into R Studio;

- 2) Imported data into R Studio from Excel table;
- 3) Checked imported data quality;
- 4) Performed hypothesis testing calculations.

To test the assumption that both population variances are equal, research team makes p-value or probability calculation. The calculated p-value or probability that both industry variances are equal is 0.0044669. Statistics researches refer to  $P < 0.05$  as statistically significant and consider 95% as family-wise confidence level, therefore researchers reject  $H_0$  hypothesis and concludes that platform and credit companies are different.

To test homogeneity of variance between both groups, research team calculates F-value using Levene’s Test. The calculated F-value is 0.6193. Statistics researches refer to a F-value  $> 10\%$  to consider a result as statistically significant. Based on the result of the calculation, the authors of the research cannot conclude that variances between both groups are not homogenous.

The final step is to test normality of platform and credit companies. Research team performs Shapiro-Wilk test of normality using the R function “shapiro.test()”. From the output of calculations, the p-value is 0.5192 and if p-value  $> 0.05$ , and normality can be assumed, implying that data of both groups are not significantly different from normal distribution.

The hypothesis test demonstrates that platform and credit companies tend to have different competency management models. Research rejects the null hypothesis and accepts the alternative hypothesis.

### III. CONCLUSIONS

Companies with intensively applied technology capital experience faster productivity growth. It is crucial for companies to identify and then regularly assess which individual level competencies are required to achieve its strategic goals. Technology and knowledge intensive companies often require competencies that are not available in the market; therefore, contemporary companies are forced to ignore qualifications and recruit employees with personality traits to fit the position. A great variety of modern technical tools, frameworks and solutions are available owing to continuous technology development and technical and business managers are striving to get familiar with as much tools and technologies as possible, but in many cases, technologies are quickly replaced with new solutions due to the rapidly changing environment and continuous learning needs to be applied. Competency management must be tied to company’s strategies. Properly assigned competences to new product or service creation positively contribute to overall business development. Knowledge-intensive fintech companies focusing on insource core competencies. Fintech companies do not maintain databases of represented competencies and utilized skills, do not analyse competency gaps and do not monitor future needs. Currently fintech companies are filling competency gaps by overrecruiting or assigning multiple roles to the same employee what leads to productivity decrease, affects competitiveness. Paper recommends further research in the area: (1) to

set types of the fintech companies to define fundamental competencies per fintech type; (2) to research fintech competency management from the sustainability aspect; (3) to continue to assess digital transformation impact on competency management in retail banking, identify retail banking fundamental competencies and define financial sector competency model.

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#### REFERENCES

- [1] M. Doggett, P. McGee, P., and Scott, S. "Toward a Technology Management Core: Defining What the Technology Manager Needs to Know," *Technology Interface International Journal*, vol.14, pp.70-79, Fall/Winter 2013.
- [2] CSB, "In the 3rd quarter of 2018, Latvian employment rate constituted 65.3 %," October 2018. [Online]. Available: <https://www.csb.gov.lv/lv/statistika/statistikas-temas/socialie-procesi/nodarbinatiba/meklet-tema/2423-nodarbinatiba-2018-gada-3-ceturksni> [Accessed: Feb. 12, 2019].
- [3] World Economic Forum, "The Global Competitiveness Report 2017–2018," December 2018. [Online]. Available: [http://www3.weforum.org/docs/WEF\\_The\\_future\\_of\\_financial\\_services.pdf](http://www3.weforum.org/docs/WEF_The_future_of_financial_services.pdf) [Accessed: Feb. 12, 2019].
- [4] M. Bontis, "Intellectual capital and performance within the banking sector of Luxembourg and Belgium," *Journal of Intellectual Capital*, vol. 14 pp. 286-309, 2012, <https://doi.org/10.1108/14691931311323896>
- [5] C. Hawkes and B. Weathington, "Competency-Based Versus Task-Based Job Descriptions: Effects on Applicant Attraction," *Journal of Behavioral and Applied Management*, vol.15, pp.190-211, May 2014.
- [6] W. Koziol, "A human capital measurement scale," *Journal of Intellectual Capital*, vol. 18, pp.316-329, 2017, <https://doi.org/10.1108/JIC-08-2016-0085>
- [7] P. Gomber, R.J. Kauffman, C. Parker, and B.W. Weber, "On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services," *Journal of Management Information Systems*, vol. 35, pp.220-265, January 2018.
- [8] J. Kansal and S. Singhal, "Development of a competency model for enhancing the organisational effectiveness in a knowledge-based organisation," *International Journal Of Indian Culture And Business Management*, vol.16, pp. 287-301, 2018, <https://doi.org/10.1504/IJICBM.2018.090909>
- [9] R. Colomo - Palacios, C. Casado - Lumbreras, P. Soto - Acosta, F. Garcia - Penalvo, and E. Tovar - Caro, "Competence gaps in software personnel: A multi-organizational study," *Computers in Human Behavior*, vol.29, pp.456-461, March 2013, <https://doi.org/10.1016/j.chb.2012.04.021>
- [10] M. Bohlouli, N. Mittas, G. Kakarontzas, T. Theodosiou, Theodosios, L. Angelis, and M. Fathi, "Competence assessment as an expert system for human resource management: A mathematical approach," *Expert Systems with Applications*, vol.70, pp.83-102, March 2017, <https://doi.org/10.1016/j.eswa.2016.10.046>
- [11] J.W. Creswell, *Research design. Qualitative, Quantitative and Mixed Methods Approaches*. London: SAGE Publications, Inc., 2014.
- [12] Mintos, "Statistics," December 2019. [Online]. Available: <https://www.mintos.com/en/statistics/> [Accessed: Feb. 12, 2019].
- [13] W. Yu, H. El Barmi, and Z. Ying, "Restricted one-way analysis of variance using the empirical likelihood ratio test," *Journal of Multivariate Analysis*, vol. 102, pp.629-640, 2011, <https://doi.org/10.1016/j.jmva.2010.11.006>