



HAL
open science

ICT History Study as Corporate Philanthropy in Latvia

Inara Opmane, Rihards Balodis

► **To cite this version:**

Inara Opmane, Rihards Balodis. ICT History Study as Corporate Philanthropy in Latvia. IFIP International Conference on the History of Computing (HC), Sep 2018, Poznan, Poland. pp.304-316, 10.1007/978-3-030-29160-0_16 . hal-02386541

HAL Id: hal-02386541

<https://inria.hal.science/hal-02386541>

Submitted on 29 Nov 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

ICT History Study as Corporate Philanthropy in Latvia

Inara Opmane[✉] and Rihards Balodis

Institute of Mathematics and Computer Science of University of Latvia, Raina bulv29, Riga,
LV-1459, Latvia
imcs@lumii.lv

Abstract. There are two ICT museums in Latvia: the Riga Technical University Telecommunications Museum and the Computing Museum of the Institute of Mathematics and Computer Science of the University of Latvia. Historical studies can be carried out at museums, institutes and universities, and professional communities. The type of history study funding can also vary. The article describes the possibilities for financing of computer museums. A comparison of museum metrics in the United Kingdom, Germany, the Netherlands and Latvia, Lithuania, and Estonia is subject to discussion. This comparison outlines the possible future museum reforms in the Baltic States. The authors review the public and private funding of museum operations. Philanthropy plays an increasing role in museum operation. Currently in Latvia, museums indirectly receive public government funding from the State Joint Stock Companies or municipalities. Private museums, corporate sponsorship and wide corporate philanthropy are the upcoming wave. ICT history studies are carried out by retired academics and authoritative engineers as volunteers. Such volunteering is the main part of developed philanthropy in Latvia. Universities play an important role in ICT history research that can be considered as one particular corporate philanthropy.

Keywords: ICT History, Philanthropy, Sponsorship, Technology Museum.

1 Scope of the Study

A historical study can be broadly defined: education, the application of the mind to knowledge acquisition, research, examination and analysis of historical facts, reflection of technology in society. Researchers are introducing various sources for the conduct of historical studies – archival documents, statistical data, parts of equipment, software packages, computer collections, item exhibits, images, stories, analysis and ways they can be used to interpret and represent the past.

We look at history study within the corporate frame of the information and telecommunication industry (ICT), but in some cases we shall also analyze such closely related topics as natural science and technology history museums or general museums in the country. ICT museums are explored as part of the museum's systems. This approach allows gaining wider public information in order to analyze the facts about museums.

In order to ensure the study of ICT history, we analyze various opportunities in Latvia. The most prominent institution for the study of history is the museum, but the operation of museums cannot be supported by the visitors' contributions alone.

Often the work of ICT history studies is carried out by volunteer researchers in research institutions. For many academic employees, history studies are a hobby. Therefore, ICT history study is often linked to technology and science research, often as an ICT historical department in a museum or a university. More or less deliberate and targeted ICT history study work is possible in various institutional forms. Three different forms of the history study organization are identified:

- Preliminary study of history – a particular study undertaken before a larger long-term targeted history study activity. Preliminary study is often a byproduct of actions undertaken for other purposes.
- ICT history studied primarily as a hobby and employee volunteer work.
- The study of ICT history, supported by a stable philanthropic funding system institutionalized at the museum.

Public information about computer museums in Europe [1–16] is analyzed. Investigative data is collected from public data sources within the wider museum community, not just computer museums [17–27], because such statistics are much broader and more accurate. Authors pay special attention to the funding of the operations of the museums. The objective of the authors is to collate data on the financing of museums in Europe and Latvia (in some positions – Lithuania, Estonia), compare that data and draw some conclusions about implementation of museum policies, financial issues and perspectives of development of computer, technology and science museums in Latvia.

The authors' study is based on analytical reviews done by other institutions at the national level (Ministry of Culture, State Administration of Museums, Association of Latvian Museums [18, 19, 20, 21]), on the transnational level data sources (OECD, ENROP, EGMUS, CAF [17, 22–26]), and other analytical papers [27–32].

Another aspect relates to the involvement of staff in the ICT history study. The study of ICT history by volunteers (often undertaken by retired academic staff and engineers) is widespread in Latvia. Such activities are carried out at the universities, the Latvian Academy of Sciences and public institutions related to historical research. The authors, being part of the ICT History study volunteers, based their findings on academic work experience. The author's publications of ICT History in Latvia are presented [33–39].

2 Computer Museums (Museums) in Europe and Latvia

Let us explain the list of internationally renowned computer museums in Europe [1–16]. Computer museums are diverse in various aspects: size of the museum, whether the museum is a legal body or a substructure of a larger museum or university, whether computer exhibits are running in the museum, or whether the museum operates as a technological or science exhibit museum. Computer museums are often specialized in PC, games, and media.

Computer museums are changing. Museums can combine their public service missions with market-based strategies and the creative economy with web-based access to museum exhibits.¹ Museums showcase the latest scientific advances to attract visitors.

Museums can be categorized, for example, as in the Latvian Museums Act or the EGMUS classification [17, 19, 27]. It is more appropriate for us to examine statistics in relation to the full range of museums, not just computer museums. We compile information about computer museums in our data collection. Considering the peculiarities of each museum, we have identified the approximate number of computer museums in European countries according to our data collection.

This approximate information shows that the majority of Europe computer museums is located in the United Kingdom, Germany, and the Netherlands (in parentheses we indicate that the minimum number of computer museums in the country; this number is our evaluation point too): United Kingdom (11), Germany (10), the Netherlands (7), Sweden (3), Italy (3), at least two computer museums are in Denmark, France, Switzerland, Spain, Poland, Finland, one computer museum is in Belgium, Croatia, Ireland, Slovenia. Compare this data, for example, with the United States (23), Canada (4), Latvia (2). In Latvia, we have the Communications Museum at the Riga Technical University and the Computer Museum at the Institute of Mathematics and Computer Science of the University of Latvia [33, 39].

The origins of establishing computer museums stem from universities (Kiel, Cambridge), well-known companies (UNISYS, Nixdorf Siemens), widely used computer components (IBM, Burroughs, Apple, Atari, Commodore), museums established by ICT communities (German Engineering Association, Leibniz Association) or the idea of establishing develops from a philanthropic support of wealthy interested individuals.

The Law on Museums classifies Latvian museums according to their type of ownership: state-funded or local-authority museums. All other museums that have not received funding from the state budget or local authorities in accordance with the Museum Law are private museums and are managed by legal entities. The network of private museums is multifaceted and spacious; they are funded by founders of the museums who are legal entities or private individuals.

For comparison, we have prepared Table 1 showing the museum metrics in Latvia, Lithuania, Estonia in comparison with UK, Germany and the Netherlands as the countries where computer museums are the most popular.

Table 1 is prepared on the basis of the EGMUS data source [17]. Data in Table 1 should be considered rough and outlines trends since EGMUS data is available in different years, not all countries have submitted data to EGMUS, and the semantics of the data submitted may vary.

From the date of Table 1 we can conclude that the museum's metrics in Latvia and Lithuania are approximately similar, Estonia is slightly different. In Latvia there are fewer private museums as in the United Kingdom, Germany and the Netherlands. Latvia has a high level of state subsidy income, despite the fact that public expenditure per 100 000 inhabitants in Latvia is lower compared to other European countries.

¹ For example, take a look at the web museums list in Germany: <http://museen.computerarchiv-muenchen.de>

Table 1. Museum metrics in the UK, Germany, the Netherlands, Latvia, Estonia, Lithuania.

	2012		2016			
	UK	Germany	The Netherlands	Latvia	Estonia	Lithuania
Number of museums	1,712	6,712	694	151	246	103
State-owned museums	58 3.3%	431 6.4%	61 8.8%	41 27.15%	78 31.7%	19 18.4%
Regional-owned museums	581 33.5%	2,585 38.5%	—	95 62.9%	86 35%	54 52.4%
Other public-owned museums	83 4.8%	441 6.6%	—	10 6.6%	—	22 21.3%
Private-owned museums	910 53%	2,995 44.6%	633 91.2%	5 3.3%	82 33.3%	8 7.8%
Museums per 100.000 inhabitants	2.75	8.17	4.10	7.6	18.7	—
Public expenditure per 100,000 inhabitants	—	—	3,021,358	1,634,004	3,321,156	—
	Highest: Luxembourg 8,069,000 EUR; lowest: Slovakia 195,101 EUR. Latvia, according to EGMUS data, is in third-lowest position before Slovakia and Bulgaria					
Science and technology museums	—	—	158 22.7%	—	22 8.9%	—
	Highest: Belgium 35.8%; lowest; Sweden 7.6%; average: 20%					
Public subsidies income	—	—	49.5%	80.8%	58.1%	—

National sources [20, 21] have insignificant differences in museum data, which explains the different semantics of these data. According to these data, currently there are 220 museums in Latvia and 18% of the total number consists of science and technology museums.

For comparison, data is collected on nine technology museums in Latvia (see Table 2) and compared with the largest Science Centre in the Baltic States (Estonia). AHHA is an internationally recognized partner in several organizations in Estonia. Table 2 includes museums that are well-known in the community and are accredited in the museum register

Table 2. Well-known in the community technology museums in Latvia.

Museum	Sponsorship		Philanthropy		Income
Riga Motor Museum ²	CSDD	Road Transport	CSDD	Society	CSDD >5 partners
LR History Museum ³	LR	Railway	LR	Society	LR
Museum for history of medicine ⁴	Legal body	Health sector	No reward	Society	The Ministry, >13 supporters
Anatomy Museum ⁵	RSU (Health)	RSU	RSU	RSU	RSU
Kurzeme Demo centre ⁶	Ventspils High Technology Park	Municipality	Municipality	Society	Philanthropy, >8 companies
Jaunmokas technology museum ⁷	Legal body	Forests community	Reward to LSF	LSF	LSF
Museum of Natural History ⁸	Legal body	Society	No reward	Society	The Ministry, >14 sponsors
Museum of Science and Technology ⁹	IMCS UL	IMCS UL	Week reward to UL	IMCS UL	UL, IMCS UL
Telecommunications museum ¹⁰	RTU	RTU	Week reward to RTU	RTU	RTU contribution
AHHAA ¹¹	Tartu University (TU)	TU	Week reward to TU	TU	Philanthropy, >12 supporters

² Historic Vehicle exposition with multimedia solutions, highlighting the museum's collections and unique exhibits.

³ Dedicated to the history of the railway and its development in Latvia, subdivision of the LR.

⁴ Direct administration institution under the Ministry of Health.

⁵ Learning about historical anatomical preparations but also a premises for varied social, educational and cultural activities.

⁶ Science and technology museum. Interactive center that offers active, entertaining, educational and interesting adventures, united with Tartu AHHA in a single network.

⁷ Jaunmokas Palace museum established by Joint Stock Company "Latvia's State Forests."

⁸ Largest and one of the oldest complex museums of natural history and sciences in the Baltic States.

⁹ Alliance of: Latvia History Museum; Zoology Museum; Geology Museum; Computing Museum, [37]; Botanical Museum; Pedagogy Museum; F. Cander Space Exploration Museum; Human Pathology Museum; Chemical History Museum.

¹⁰ Now mainly a radio museum.

¹¹ Science Centre AHHA, Tartu, Estonia.

In Table 2, data show that in most cases a large industrial company (usually a state-owned enterprise) finances the history museum. In addition to this form of museum funding, there is support from the public sector and sponsorship. In the case of Latvia, we can rarely speak of philanthropy (altruism).

3 Various Philanthropy Funding for Museum Operations

It is not possible to support an historical study from museum visitors' contributions (money earned by the museum) alone, which ranges from 3 to 15 euro per visitor; for this purpose, historical institutions and historical collections attract funds, projects, and donations. Museums have a permanent strategy how they can combine their public service missions with market-based strategies.

Policy makers in U.S. museums recognize that in earlier times, museums were supported by three periods of museum funding:

1. *Philanthropic period*, characterized by the exclusive support of wealthy individuals
2. *Transitional period*, in which increasingly professional management increased revenues
3. *Funding phase*, in which institutions such as corporations and foundations picked up the work previously ascribed to wealthy philanthropists and amplified the pressure toward populism and large-scale exhibitions [28].

Regardless of the diversity of the situation, it can be estimated that there are at least three shares to the funding of a museum: the government (state) budget (20–25%), private (35%), and earned (25%) [17]. Public funding is determined by politicians or community leaders. They earn a share of the museums themselves, but part of private funding is publicly exposed.

The public part covers direct financial support (subsidies, awards and grants, as well as lottery funds provided by central and lower government levels); state indirect financial support (tax expense); private financial support from non-profit organizations, business organizations, and individual donations. Museums require donations from citizens and corporations. The ENROP 2017 study shows that households are the main source of philanthropic contributions (53%), followed by corporations (25%), foundations (19%) and lotteries (3%) [25].

As can be seen in Table 3, in Latvia, the World Giving Index and the population's charity culture are low. The situation is ameliorated with volunteering. Donations in Latvia most typically reach organizations whose public benefit status allows companies and individuals to receive tax rebates [27]. Individual donations for various charity campaigns are popular, either with a donation phone call or a supermarket cash register with special donation boxes. There are extremely few foundations created by individuals. The public benefit status in Latvia can be granted in nine areas. The following areas overlap with the classification of public benefit activity fields provided by The European Research Network on Philanthropy (ERNOP): education (ICT History study projects), health, culture (ICT History study projects), environment and social welfare (ICT

History study projects). Religion and international assistance included by ERNOP but are missing in Latvia.

Table 3. Data from the World Giving Index published by the Charities Aid foundation (2011).

	UK	Ger- many	The Neth- er- lands	Latvia	Esto- nia	Lithu- ania
People giving money to charities	73%	49%	77%	16%	12%	4%
People volunteering time for an organization in the last month	29%	28%	39%	18%	15%	6%
People who have helped a stranger in the last month	58%	56%	46%	34%	37%	33%
World giving index score (average)	53%	44%	54%	23%	21%	14%

There are different requirements for philanthropy, charity, donations, sponsorship, cash contributions to different countries, in particular for various tax obligations. The situation assessment in Latvia is given in Table 4.

The financing of a historical study meets the corporate social responsibility from commercial sector and public authorities. Typically, funding is as follows: private foundation (includes corporate foundation), public foundation (government related foundation), community foundation, fundraising foundation. philanthropy (corporate philanthropy) and sponsorship (corporate sponsorship) are different. We will analyze four distinctions [39]:

1. Corporate sponsorship is a mutual business proposition that offers value in exchange for money. Corporations get a return on their “investment,” enhance their profile, associate their brand with a cause, and or attract customers who support that cause.
2. Corporate sponsorship can be managed by most any department within a corporation including: sales, marketing, training and development, etc.
3. Corporate philanthropy is motivated by altruism and supports a socially beneficial cause without financial or material reward to the corporation.
4. Corporate philanthropy is often managed by an internal community relations team or a corporate foundation. The corporation aims to enhance its image and promote goodwill with stakeholders and the community.

The wealthy Latvian state joint-stock company funds are allocated to cultural, sports and educational projects, either managed by the companies themselves as separate projects or by entering into contractual relations with cultural, sports and charitable organizations that organize open tenders to beneficiaries. According to the classical understanding, these funds cannot be called philanthropic foundations.

Table 4. Assessment of charity in Latvia.

	Philanthropy	Donation	Sponsorship
Type of supporter	Private persons, funds	Private persons, companies	Companies
Support motives	Altruism	Altruism, tax rebates	Supports the motive with the ability to achieve their goals
Cooperation with the supported	Partly	No	Yes
Sport	Very rare	Rare	Dominant
Culture	Dominant	Often	Often
Social area, ecology	Often	Dominant	Rare
Media	No	No	Dominant
Political parties	No	Dominant	No
NGO	Often	Dominant	No
Design maker	Private companies	Financial system	Company board

The first priority of a commercial company is economic considerations, which means profitable business, followed by obligations arising from the performance of legal duties, including taxes and other statutory requirements. If the company has met these essential requirements, this may apply to Corporate Social Responsibility, including sponsorship and philanthropy. Obligations of philanthropists are duties that go beyond what is simply needed or considered by the company to be correct. They try to benefit from the community, for example by donating services to community organizations, engaging in projects to support the environment or donate money to charities.

Latvian practice shows that companies start with sponsoring political organizations and individual NGOs, donations for sports and art, and only the next wave is wider philanthropy. Various forms are used to transfer funds for Corporate Social Responsibility and voluntary help, usually in cash, for those who need it: philanthropy, charity, donations, sponsorship and contribution.

There is no strict borderline between sponsorship and philanthropy. The main difference is that there is no direct reward to the donator. Usually the money donor wants direct or indirect benefits, and we are most often talking about sponsorship.

If there are more sponsors, then it is less possible to pinpoint the benefits to the money lender. In our classification in Latvia, if the number of sponsors is more than 6, then we believe that the goals of the philanthropists are fulfilled.

4 Preliminary ICT History Study Activities in Latvia

We talk very often about history – in everyday life and in events, in various corporate documents. Innovative project proposals often start with a historic background. In corporate events we remember historical facts. We find historical facts in the staff CVs.

In the short term, we usually talk about history. It is an unconscious, indirect gathering and analysis of ICT historical facts. A historical study is another side effect for someone else's purpose. The history study closely reflects science and research activities. Typical historical facts are remembered at scientific and public organization conferences. Let us take a look at organizational events in Latvia, where historical facts are discussed and analyzed indirectly.

- a. The University of Latvia organizes Programmer's Days since 1998, and since 2000, students have been awarded the Ada Lovelace and Charles Babbage Prize.
- b. In 1990, the Latvian Radio Electronics and Communications Engineers Foundation established the J. Linter Prize. But on 20 December 1993, Lattelekom, LMT, and Tele2 founded the J. Linter Foundation. In 18 years, 423 specialists of the electronic communications industry received J. Linter awards. The purpose of the prize is to stimulate the contribution of individuals and groups of individuals to the comprehensive development of the Latvian radio and electronic communications industry.
- c. Recognition, which can be acquired only once in a lifetime, was founded in 2000, named after Professor Eizens Āriņš, the founder of computer science in Latvia. Corporations (Lattelecom, Latvian Mobile Operators LMT, Tele2) hold annual professional conferences – Technology Days – to talk about future innovative technologies and history before and discuss the annual success of the corporation and the state.

5 ICT History Study as Volunteering (as a Hobby)

Why are Latvian (Eastern Europa) ICT museums and ICT development history important internationally?

- a. Since the 1990s, Latvia has rapidly changed its economic system to a market economy. The subject of the ICT history study is how the economic restructuring reflects to following changes in the technology platform.
- b. In the late 1960s, the Union of Soviet Socialist Republic brand of computers were replaced by development of mass production of the ES EVM (United System Electronic Computing Machines), which is a cloned prototype of the IBM computers.¹² At the beginning of the 1990s, the technology platform was changed back to the original Western products. Which conclusions could be received from that?
- c. What can we say about ICT convergence in both economic systems?

Nowadays, historical study had engaged corporations retired academics and authoritative engineers. However, such a historical study model in the long term is exposed to high risk of being discontinued.

The following activities in Latvia are mainly based on volunteer's work (no salaries or tiny salaries for involved employees); all these activities are characterized by a minor annual budget. A similar situation in the ICT history study is found in the universities and historical studies supported by associations:

¹² See Kitov, "Main Teleprocessing Monitors," this volume.

- Baltic Association of the History and Philosophy of Science (Conferences & Seminars, The journal *Acta Baltica Historiae et Philosophiae Scientiarum*, publishing articles of the history and philosophy of natural and social sciences), from the Latvian branch of Association of History of Science;
- Latvian Association of History of Medicine;
- Baltic Association of Historians of Pedagogy.

Authors are volunteers too, and their competence in ICT Historical Study is presented in publications, for instance”

- a. Computing Museum of Institute of Mathematics and Computer Science University of Latvia (IMCS UL). The museum has 7,372 exhibits. In 2017, there were 239 visitors per year. IMCS Computers and IT museum was established 1984. Historical documents, computer parts and photos are collected in the museum. History of computer use in IMCS UL to the middle of the 1990s and the transformation from computing center to research institution. History of collaboration with Nordic Countries that provided political, scientific and technological support [33].
- b. IMCS UL and three socio-technological waves of IT (from 1959). The first wave – the formation of industrial computer production in Russia (1960–1970). These were the first original computers of the Soviet production of the BESM series and Minsk. The second wave is the production of the EC EVM computers cloned from IBM’s developments (1970–1990). The third wave (last) – the use of personal computers, the rapid development of the Internet, the globalization of IT. For Latvia, this wave was accompanied by significant social changes by integration into the European Union [34].
- c. History of Data Centre Development. Publication describes the history of data center development. In the beginning of the computer era, computers were installed in computing centers because all computing centers have specific requirements according to which their operation is intended for [35].
- d. Way of Internet development in Eastern Europe. Collection of Untraditionally Developed Academic IT Services and development of Internet in Eastern Europe. Deep and radical social reforms of the last century’s nineties in many Eastern European countries caused changes in Information Technology’s (IT) field. Compared to the international practice, academic services were developed in Eastern Europe in an untraditional way, which provided positive technological changes [36].
- e. Accounting System for Computing Resources Usage – History and Development in Latvia. Introduction of accounting system for computing resources usage mainly has two goals: optimizing operating systems performance and billing tracking as well as invoicing customers for use of computing services. This problem becomes obvious with the introduction of time-sharing systems. In the era of personal computers, the accounting problem disappeared, but now due to the development of cloud computing it has renewed. The paper proposes to discuss the accounting systems for different computing resources – virtual machines, high-

performance computing and data storage, accounting for use of different applications and development today [37].

- f. The Convergence of Telecommunications and Information Technologies – Historical View in Latvia. The article identifies the main cornerstones in the history of ICT convergence process in Latvia. The technological basis for convergence is the transition from analog to digital communication and processing of all incoming information in digital computer devices. The authors of the article analyze the transformation of the higher education in industry sector and structural changes of company's employees in the process of convergence. The analysis of the transformation in education programs is carried out on the basis of the Association for Computing Machinery (ACM) Curricula Recommendations in different times and different disciplines. Concept of computing and communication convergence has many years of history – as strategic concept it started about 1977 and yet has many definitions. The idea behind convergence concept is mostly related to convergence between computing and telecommunication common technologies, services and service provider's business models. In this academic position paper some less significant obstacles of influence-reflection of convergence to legislation system, higher education programs and industry labor market are discussed [38, 39].

6 Conclusion

Preliminary ICT History Study activities are performed by state institutions or professional associations, mainly engaging retired scholars or highly skilled engineers in historical research and analytics. Today, the main business case for ICT (science, technology) historical study in Latvia is based on volunteers (possibly, the same is true throughout Eastern Europe). Utility sectors (such as the Ministry of Environmental Protection and Regional Development, the Ministry of Transport, The Ministers for Agriculture) ensure the maintenance of museums directly or through the State Joint Stock Companies. A more stable ICT historical study business model is based on sponsorship or the next phase of Corporate Social Responsibility – Philanthropy. Today, Corporate Social Responsibility is related to sponsorship for political parties, NGOs (for example, ICT professional associations support over 100 corporations), sports, art, but the authors believe that support of the Museum (ICT History Study) is expected only at the next level.

Acknowledgement. The publication has been supported by European Regional Development Fund within the project No. 1.1.1.5/18/I/016 University of Latvia and Institutes in the European Research Area – Excellence, Activity, Mobility and Capacity.

References

1. Heinz Nixdorf Museums Forum Homepage, <https://www.hnf.de/start.html>, last accessed 2018/08/16.

2. Unisys Computer Museum Belgium Homepage, <http://www.unisys.be/aboutus/about-unisys-belgium>, last accessed 2018/08/16.
3. Deutsches Museum in München Homepage, <https://www.deutsches-museum.de>, last accessed 2018/08/16.
4. Computermuseum der FH Kiel Homepage, <http://www.fh-kiel.de/index.php?id=186>, last accessed 2018/08/16.
5. Oldenburger Computer-Museum Homepage, <http://www.computermuseum-oldenburg.de>, last accessed 2018/08/16.
6. Computer spielemuseum Berlin Homepage, <http://www.computerspielemuseum.de>, last accessed 2018/08/16.
7. Technisches Museum in Wien Homepage, <http://www.technischesmuseum.at>, last accessed 2018/08/16.
8. ENTER Museum Switzerland Homepage, <http://www.enter-online.ch/index.php?id=taetigkeit>, last accessed 2018/08/16.
9. The Centre for Computing History Cambridge Homepage, <http://www.computinghistory.org.uk>, last accessed 2018/08/16.
10. The National Museum of Computing, Bedfordshire Homepage, <http://www.tnmoc.org>, last accessed 2018/08/16.
11. Musee de l'Informatique in Paris Homepage, <http://www.eutouring.com/musee>, last accessed 2018/08/16.
12. Danish Museum of Science and Technology Homepage, <http://tekniskmuseum.dk>, last accessed 2018/08/16.
13. Swedish Computer Museum Homepage, <http://www.datamuseet.se/english>, last accessed 2018/08/16.
14. Dansk Datahistorisk Forening Homepage, www.datamuseum.dk, last accessed 2018/08/16.
15. The Computer History Museum California Homepage, <http://www.computerhistory.org>, last accessed 2018/08/16.
16. The Russian Virtual Computer Museum Homepage, <http://www.computer-museum.ru/english/>, last accessed 2018/08/16.
17. EGMUS - The European Group on Museum Statistics Homepage, <http://www.egmus.eu>, last accessed 2018/08/16.
18. Latvia. Ministry of Culture Homepage, www.km.gov.lv, last accessed 2018/08/16.
19. Latvia. State Authority on Museums Homepage, <http://www.km.gov.lv/en/ministry/depend.html#mus>, last accessed 2018/08/16.
20. Latvian Museum Association Homepage, <http://www.muzeji.lv>, last accessed 2018/08/16.
21. Cultural map portal. Homepage, <http://www.kulturaskarte.lv/lv/muzeji>, last accessed 2018/08/16.
22. OECD Homepage, Public and Private Social Expenditure by country, <http://www.oecd.org>, last accessed 2018/08/16.
23. The OECD Centre on Philanthropy Homepage, Data and Analysis for development, www.oecd.org/development/philanthropy-centre, last accessed 2018/08/16.
24. Giving in Europe country reports Homepage, <http://ernop.eu/giving-in-europe-launched-at-spring-of-philanthropy>, last accessed 2018/08/16.
25. The European Research Network on Philanthropy (ERNOP) Homepage, <http://ernop.eu>, last accessed 2018.08.16.
26. Charities Aid Foundation Homepage, <https://www.cafonline.org>, last accessed 2018/08/16.
27. State of Giving Research in Republic of Latvia. 2016, https://www.lu.lv/fileadmin/user_upload/lu_portal/projekti/lu_fonds/Velos_atbalstit/GivingLatvia_Report_2013_20160811.pdf, last accessed 2018/08/16.

28. Matthew Kwatinetz. The Bull & the Ballot Box: Art Museum Economic Strategies, <https://penniur.upenn.edu/uploads/media/Bull%20and%20the%20Ballot%20Box%20Art%20Museum%20Economic%20Strategies.pdf>, last accessed 2018/11/14.
29. Victoria D.Alexander,; From philanthropy to funding: The effects of corporate and public support on American art museums. *Poetics*. Volume 24, Issues 2-4, 1996, pp. 87-129.
30. An overview of philanthropy in Europe. Observatoire de la Fondation de France / CERPhi, 2015.
31. Financing the Arts and Culture in the European Union, Directorate General Internal Policies of the Union European Parliament IP/B/CULT/ST/2005_104, 2006/11/30.
32. Laila Kundzina - Zvejniece.: Corporate philanthropy in Latvia, https://www.lu.lv/fileadmin/user_upload/lu_portal/projekti/lu_fonds/kapec-ziedot/KundzinaZvejniece_CorporativeFoundations_Latvia.pdf , last accessed 2018/08/16.
33. R. Balodis, J. Borzovs, I. Opmane, A. Skuja, and E. Ziemele. Research Directions Profile in the Computing Museum of the Institute of Mathematics and Computer Science, University of Latvia (IMCS) , *History of Nordic Computing*, pp. 453-461. Springer Nature (2011).
34. R.Balodis, I.Opmane.: Institute of Mathematics and Computer Science, University of Latvia, and three socio-technological waves of IT, *Materials of the Second International Conference on the Development of Computer Technology and its Software in Russia and the Former Soviet Union (SoRuCom-2011)*, pp.36-40.
35. R. Balodis, I. Opmane.: History of Data Centre Development, *Reflections on the History of Computing: Processing Memories and Sharing Stories*, pp. 128- 151, IFIP AICT Volume 178, 2012, The Book Serie: Lecture notes in Computer Science, Subseries: IFIP - Advances in Information and Communication Technology.
36. R. Balodis, I. Opmane.: Collection of Untraditionally Developed Academic IT Services, *World Academy of Science, Engineering and Technology International Journal of Humanities and Social Sciences Vol:7, No:2, 2013*, pp.350-354.
37. R.Balodis, I.Opmane.: Accounting System for Computing Resources Usage - History and Development, *Computer Technology in Russia and in the Former Soviet Union, Selected Papers 2017 Zelenograd, Russia, IEEE Computer Society*, pp. 179-182, 2018.
38. R.Balodis, I.Opmane.: The Convergence of Telecommunications and Information Technologies - Historical View in Latvia, *Computer Technology in Russia and in the Former Soviet Union, SoRuCom 2017 Selected Papers, Zelenograd, Russia IEEE Computer Society*, pp. 183-190, 2018.
39. Opmane, R. Balodis,; Computing and Communication Convergence Reflection to Legislation System and higher education programs, *The 8th International Conference on ICT Convergence*. October 18-20, 2017, *IEEEExplore 2017*, pp. 184 – 189.
40. Anisha Robinson Keays. 4 Differences Between Philanthropy and Corporate Sponsorship, March 16, 2015 <https://www.linkedin.com/pulse/4-differences-between-philanthropy-corporate-anisha-robinson-keays>,last accessed 18/08/16.
41. J.Locmelis,; Telecommunications history, Lattelecom museum, 2000, 406 pages, (In Latvian).