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Preparing Museum Disaster Plan: Risk Ranking Through the Analytical Hierarchy Process

Kurmo Konsa
Tartu Art College, Tartu, Estonia

Kaie Jeeser
Tartu City Museum, Tartu, Estonia

Abstract: *The object of this paper is to introduce a new approach for ranking risksin museums through the analytic hierarchy process (AHP). The AHP provides a flexible and easily understood way to rank disaster risks in museums. It is a multi-criteria decision supporting methodology that allows subjective as well as objective factors to be considered in the process, which is precisely what is needed. AHP involves the principles of decomposition, pairwise comparisons, and priority vector generation and synthesis. Though the purpose of AHP is to capture the stackholders' judgements about the situation in a museum, this approach also improves the stakeholders' satisfaction through improved transparency in the ranking process and their increasing awareness of and participation in the process. One of the main advantages of this method is the relative ease with which it handles multiple criteria. In addition to this, AHP is easier to understand and it can effectively handle both qualitative and quantitative data. AHP will be discussed in more depth with the example of the risks rating of the Tartu City Museum's (TCM) disaster plan.*

Keywords: *museum, risks, risks rating, analytic hierarchy process, disaster plan, Tartu City Museum, storage facilities,exhibition rooms*

1. Introduction

Although natural disasters and different types of emergencies are relatively uncommon, they can nevertheless cause extensive damage, the consequences of which are usually very expensive to recover from. Oftentimes, since many objects are either irreplaceable or very expensive to replace, the damage caused by disasters is irreparable. In order to prevent and diminish the effects of potential disasters and accidents on objects, readiness and preparations are of utmost importance. This is best guaranteed by having a disaster plan. The disaster plan is tightly connected to other aspects of conservation and makes up an important part of the conservation plan [1].The disaster plan is a document that describes preventive measures for emergencies, the procedure of reacting in case of accidents and the elimination methods of damage. The disaster plan is developed over the course of the disaster planning process. Preparation of disaster plans became popular in the 1980s,first and foremost withthe spread of the concept of preventive conservation in memory institutions.

Three stages can be distinguished with each disaster: before a disaster, during a disaster and after a disaster. The process of disaster planning addresses all three stages. The elements of the stage “before a disaster” are risk analysis, preventive measures and preparedness. The situation “during a disaster” is dealt with by implementing the procedures of responding to a disaster, and the situation “after a disaster” is dealt with by disaster recovery plans [2]. A significant part of disaster planning is to identify potential threats and forecast their effect on the collections, buildings, staff and visitors. The methods of carrying out a risk analysis can be divided into qualitative methodsand quantitative methods. With quantitative methods, certain values are attributed to the probability and consequences of events. For this, figures based on the accident statistics and the monetary value of damage are used to calculate, for example, the monetary value of annual risk. With qualitative methods, the probability of threats and the expected damage are assessed on the scale of subjective estimates. Quantitative risk analysis can be difficult due to insufficient and incorrect basic data. Memory institutions mostly use qualitative and quantitative risk analysis methods in a combined manner [3; 4; 5; 6]. A method of ranking risks that enables the combination of both quantitative and qualitative features is the analytic hierarchy process (AHP), which will be discussed in more depth with the example of the risk rankings of the Tartu City Museum's (TCM) disaster plan. AHP has been used to analyse different conservation-related problems [7; 8; 9; 10; 11; 12; 13]. It has also been used for risk analysis [14].This paper attempts to provide a basic application of the AHP in risk ranking in museum disaster planning.

2. Object of Study

TCM was established in 1955 and is an Estonian municipal museum managed by the city government of Tartu. TCM has four branches: Oskar Luts Home Museum, the 19th Century Tartu Citizen's Home Museum, the KGB Cells Museum and the Tartu Song Festival Museum. TCM collects, studies and conserves material related to the history of Tartu, and organizes the mediation of the material to the general public for research, educational and entertainment purposes, introducing the materials in permanent exhibitions, temporary exhibitions, and in both scholarly scientific and popular scientific publications.

As of 2016, there are 163,787museum objects in the museum collection of TCM. The permanent exhibition on display in the main building of TCM, an elegant former noblemen's mansion situated at Narva Road23, displays the history of Tartu up to the year 1920. Temporary exhibitions are held in the building, as well as educational programs and entertainment events. The total area of the main building is 1,182 square metres (m2). In addition to the exhibition area—311 m2and administrative rooms, there are also five storage rooms with a total area of 158.9 m2. The 19th Century Tartu Citizen's Home Museum, which is located at 16 Jaani Street in Tartu's historic Old Town, shows the mindset and the way of life of the nineteenth century. It is situated in a wooden home that was built in 1740, and is fully used as a museum. The exhibition includes furniture, items, graphic works etc. There are no storage facilities in the building. The Oskar Luts Home Museumis situated in at 38 Riia Street,in a detached house built in 1936. The museum rents the exhibition rooms and a storage room from the owner of the house. In addition to the exhibition rooms, there is also one storage room (7 m2) in the building. The Museum of KGB Cells, located at 15b Riia Street, introduces the repressions and resistance movement that took place in Tartu in their historic environment, the former cells of the NKVD, The People's Commissariat for Internal Affairs, the Soviet secret police. The museum rents the exposition rooms in the basement of a commercial office building. There are no storage facilities on the premises. The Song Festival Museum is located at 14 Jaama Street in a house protected under heritage conservation which was built in the first half of the nineteenth century. The museum building includes exhibition rooms, working rooms and a hall. The rooms that are located on the second floor of the building are in a separate zone from the museum rooms, and have been rented out by the city government.

In addition to the main building, the storage facilities of the TCM are also located on three rental premises: separate storage rooms (127 m2) in a large storage facility situated at 127 Tähe Street in Tartu; a room (21 m2) made into an archaeological storage facility in the basement of a university building at 3 Lossi Street; and a two-room apartment (34 m2) in a typical four-story Soviet apartment block at 16 Lutsu Street.

3. Method

Upon conducting a risk analysis when preparing a disaster plan, many hazards of different natures need to be taken into consideration: fires, water emergencies, human attacks, infrastructure breakdowns etc. Moreover, the effects of different risk factors vary, as do the effects of different environments, with storage facilities and exhibition rooms located in different buildings. Analytical hierarchy process (AHP) used in this study for the ranking of different risks. The method was developed by Thomas L. Saaty, an American mathematician, in the 1970s [15]. It is a method for complicated problems requiring decision-making where both quantitative criteria and qualitative criteria that are hard to express in numerical form are considered [16].AHP allows making objective decisions using subjective assessments, i.e., expert judgements as the input data. AHP is universal as it can be used both with qualitative and quantitative criteria, and it sets no limit to the number of alternatives and criteria. B. S. Ahn finds in his article [17] that theAHPcan be used very effectively when making decisions with a group of people.

The method is based on the idea that people are more capable of making relative judgements rather than absolute judgements [18]. It is more simple and precise to express one's preferences by simultaneous comparison of two criteria or alternatives than by comparison of all criteria or alternatives [19]. In the first stage, a hierarchical structure of the problem to be solved is constructed.

In simpler cases, the hierarchical structure is only made of three levels: the goal, criteria and alternatives. In a more complex case, the structure might consist of more levels, as goals can be divided into sub-goals, criteria into sub-criteria, etc. As a next step, the alternatives are compared against each other by criteria. When comparing the alternatives, it is asked which alternative is more "preferred" by criteria [20]. Preferences are measured on the basis of the nine-point Saaty scale (Table 1). As can be seen from the table, both verbal and corresponding numerical comparisons are used. Verbal comparisons are more attractive, user-friendly and more characteristic to people's everyday life than numbers [21]. Upon making comparisons, both expert opinions (expressing relative preferences) and actual data can be taken into consideration [22].

Table1. *Fundamental ratio scale in pairwise comparison (Saaty 1996).*

Intensity of importance	Definition	Explanation
1	Equal importance	Two criteria contribute equally to the goal.
3	Weak importance of one over another	Experience and judgment consider one criterion slightly more important than another.
5	Essential or strong importance	Experience and judgment consider one criterion strongly more important than another.
7	Demonstrated importance	A criterion is considered strongly more important and its dominance demonstrated in practice.
9	Absolute importance	The evidence showing one criterion to be more important than another is of the highest possible order of confirmation.
2, 4, 6, 8	Intermediate values between the two adjacent judgments	When compromise is needed
If criterion A has one of the above non-zero numbers assigned to it when compared with criterion B, then B has the reciprocal value when compared with A.		

The information from the pairwise comparison is represented in a pairwise comparison matrix. The relative value (weight) of each criterion is found from the pairwise comparison matrix. Different ways can be used for this, such as finding the eigenvalue and eigenvector, the geometric mean or the arithmetic mean [23; 21]. In case of the original method of AHP, the technique based on eigenvalue and eigenvector is used [22]. However, finding the geometric mean of the rows of the matrix and normalising it is an alternate possibility, partly overlapping with the eigenvector. In this paper, the latter option was used. The relative normalized weight of each attribute was found by calculating the geometric mean of the each row, and normalizing the geometric means of rows in the comparison matrix.

As assessments are made in the form of group work, it is important to check their correspondence to each other. The consistency of single judgements – i.e., their correspondence and lack of inconsistencies – are expressed by consistency ratio [15]. A consistency ratio of 0.10 or less is considered acceptable; otherwise, some judgments need to be revised.

As the criteria used to compare alternatives are usually not with the same importance, these also need to be compared against each other. When comparing them, all criteria are compared pairwise. This is similar to the weighing of alternatives. In the end, the identified weights of alternatives are added, and the sum is multiplied by the weight of criteria. The received total weight of alternatives is what decides the final ranking.

The aim of the analysis described in this article was to rank the importance of risk factorsof using the storage facilities and the exhibition rooms of TCM as the example. Risk factors can be classified in several ways. One possibility is to differentiate disastrous risks and risks with a constant effect. Disastrous risks include fires; water damage; demolition of constructions of the building; demolition of furniture such as shelves, cupboards, and display cases; spread of biodamaging agents, mainly insects and mould; human attacks, including theft, vandalism, terrorism, etc.; power cuts and disruptions in the work of technical equipment, including ventilation, heating, air conditioning, computers and security systems, as a result of which, the parameters of the internal environment of the building change quickly, affecting the general safety. Risks with constant effect include different contaminants, the effects of light, temperature and relative humidity, vibration, administrative mistakes in describing the collections and in designing the treatment procedures of objects, etc. As the aim of risks ranking was the preparation of a disaster plan, only disastrous risks were focused on.

The risks ranking procedure was preceded by a description of the state of the buildings and the rooms. As the museum lacked such a database, one was prepared over the course of inspecting the buildings and rooms. The inspection was performed by an external expert of disaster plan preparation, an external construction expert, and the Head Treasurer of the museum. Specialists working with the collections also participated in the state assessment. Risks ranking was conducted as group work; in addition to the group responsible for the preparation of the disaster plan, the museum staff also participated.

4. Results and Discussion

The objects stored at the museum are located either in storage facilities, exhibitions or work rooms. As most objects are either permanently or temporarily located in storage facilities and exhibitions, the risk assessment was conducted for storage facilities and exhibition rooms. As the conditions in storage rooms and exhibition rooms are quite different, their risk analysis was conducted separately. The analysed storage facilities and exhibition rooms were assessed regarding each risk factor by using the Saaty scale. Below is an example of ratings of the relative importance of fire risk among four sites (Table 2). By looking at the relative importance, it appears that the risk of fire accidents is the highest at the storage facility at Lutsu Street. This is followed by the storage facility at Lossi Street, with a more than 50% lower risk level. The risk of fire accidents is even lower in the storage facility at Tähe Street, and very low in the storage facilities of the main building. The results are not surprising, as the electrical wiring has not been changed in the storage facility at Lutsu Street, where the museum rents just one flat in a block of flats, thus having no control over the building's maintenance or use. There is also no fire alarm system installed. The storage facilities at Lossi Street are located in the basement, where there is a risk of a power emergency, due to increased humidity. The storage facilities located at Tähe Street, as well as those in the main building, are the newest, equipped with a fire alarm system. The main building also has an automatic fire extinguishing system.

Table2. *Risk of fire accidents in storage facilities*.

Rooms	Main building	Lossi Str	Lutsu Str	Tähe Str	Relative importance
Main building	1	1/5	1/7	1/3	0.054
Lossi Str	5	1	1/3	3	0.263
Lutsu Str	7	3	1	5	0.564
Tähe Str	3	1/3	1/5	1	0.117
Consistency ratio is 0,033					

Since the storage facilities and exhibition rooms were assessed separately, in Table 3, we also show the assessments of exhibition rooms regarding the same risk factor (fire). The fire risk is the highest in the Citizen's Home Museum. This is due to

Table3. *Risk of fire accidents in exhibition rooms.*

Rooms	Main building	Luts Home Museum	KGB Cells	Citizen's Home Museum	Song Festival Museum	Relative importance
Main building	1	1/3	1/5	1/7	1	0.053
Luts Home Museum	3	1	1/3	1/5	3	0.122
KGB Cells	5	3	1	1/3	5	0.259
Citizen's Home Museum	7	5	3	1	7	0.510
Song Festival Museum	1	1/3	1/5	1/7	1	0.053
Consistency ratio is 0,030						

the fact that in order to create historical atmosphere, open fire is used for lighting.There is also a wood stove. The risk level is 50% lower in the KGB Cells, where thenmain issue is the electrical system that does not function well due to the high level of humidity. The fire risk in the Luts Home Museum is four times lower than in the Citizen's Home Museum. The problem there lies in wood stove heating and the lack of a fire alarm system. The fire risk in the Song Festival Museum and the exhibition rooms of the main building is similarly at a very low level. These are newly-renovated rooms which are equipped with a fire alarm system. All storage facilities and exhibition rooms are compared in a similar manner in relation to all risk factors. The summary of the findings is shown in Tables 5 and 6.

As risks have different levels of importance, a pairwise comparison was conducted among the risk factors. Once again, the Saaty scale was used for comparison and the results are shown in Table 4. The most significant risks was fire; this is evident in risk analyses conducted at many museums [24]. This is followed by water and demolition of building constructions. Biodamage and human attacks have a considerably smaller weight, and demolition of furniture and infrastructure disruptions are the least significant. To receive final risk assessments, the assessments of storage rooms and exhibition rooms are combined with the risk weights. The final risk assessments of the storage facilities are shown in Table 5 and final risk assessments of the exhibition rooms in Table 6.

Table4. *Pairwise comparison of risk factors and the weights of risk factors.*

Risk factor	**Fire**	**Water**	**Demolition of constructions**	**Demolition of furniture**	**Biodamages**	**Human attack**	**Infrastructure damage**	**Weights**
Fire	1	3	3	7	5	5	7	0.379
Water	1/3	1	3	7	5	5	7	0.277
Demolition of constructions	1/3	1/3	1	7	1	1	3	0.113
Demolition of furniture	1/7	1/7	1/7	1	1	1	1	0.041
Biodamages	1/5	1/5	1	1	1	1	5	0.079
Human attack	1/5	1/5	1	1	1	1	5	0.079
Infrastructure damage	1/7	1/7	1/3	1	0	0	1	0.029
Consistency ratio is 0,063								

Table5. *Risk assessments of storage facilities.*

	Risk factor							
	Fire	Water	Demolition of constructions	Demolition of furniture	Biodamages	Human attack	Infrastructure damage	Weights
Storage facilities								
Main building	0,054	0,054	0,391	0,063	0,043	0,054	0,145	0,089
Lossi Str	0,263	0,564	0,391	0,578	0,420	0,263	0,378	0,385
Lutsu Str	0,564	0,263	0,150	0,237	0,115	0,564	0,378	0,373
Tähe Str	0,117	0,117	0,066	0,120	0,420	0,117	0,097	0,131

Table6. *Risk assessments of exhibition rooms.*

	Risk factor							
	Fire	**Water**	**Demolition of constructions**	**Demolition of furniture**	**Biodamages**	**Human attack**	**Infrastructure damage**	**Weights**
Exhibition rooms								
Main building	0,053	0,085	0,344	0,463	0,061	0,073	0,053	0,109
Luts Home Museum	0,122	0,202	0,129	0,073	0,182	0,195	0,259	0,294
KGB Cells	0,259	0,463	0,053	0,195	0,347	0,195	0,510	0,294
Citizen’s Home Museum	0,510	0,045	0,129	0,073	0,347	0,463	0,053	0,285
Song Festival Museum	0,053	0,202	0,344	0,195	0,061	0,073	0,123	0,132

Risks are the highest in the storage facility at Lossi Street. There is a high risk of biodamage and furniture damage, as well as water damage. Next in the ranking is storage facility at Lutsu Street, with quite similar risks. The situation is the best in the storage facilities of the main building: here, the risk level is six times lower in comparison with the risk at the storage facility on Lossi Street. The analysis clearly shows that the risk level in the storage facilities at Lossi Street and Lutsu Street is unacceptably high. Since these are rental premises, it has been recommended to museum management that these facilities be replaced with more suitable rooms.

The risk is the highest in the exhibition rooms at the Luts Home Museum and at the KGB Cells Museum; the risk is almost as high at the Citizen's Home Museum. The risk level of the Song Festival Museum is significantly lower; and the exhibition rooms of the main building are at the lowest risk level. The preventive measures that have been scheduled include the installation of security alarm systems at the Luts Home Museum, and adjustments of the electrical system at the KGB Cells to counter the higher humidity levels.

The conducted risks ranking prepared a foundation for the preparation of a disaster plan, providing information about potential risk factors in different buildings and rooms and allowing the prioritizing of risks. Based on the conducted risk analysis and the discussion held with the museum staff, preventive measures were designed that would help to diminish potential risks. The prioritization of risks by buildings and risk factors allowed developing specific preventive measures, accident response procedures and recovery plans for each separate room.

5. CONCLUSIONS

The AHP – based risk assessment method allows estimating the significance of main risk factors in different storage facilities and exhibition rooms. The conducted ratings of risks was the foundation for the preparation of Tartu City Museum's disaster plan. Implementing AHP facilitates the a relative rating of risksand allows the input of all museum employees. The rating of risks can be carried out based upon the everyday experience of the staff, and AHP allows structuring group discussions and presents the results in an easily understandable manner.

AHP proved to be a very appropriate method for carrying out the risk ratings. It allows treating both quantitative and qualitative criteria. It takes into consideration the different relative importances, i.e., weight of criteria. AHP also allows comparing alternatives on a single absolute scale, and allows having a structured dialogue between different specialists. Since the final assessments are expressed in figures, it allows easy prioritisation of preventive activities. Finding a consistency index allows the assessment of the consistency of the entire process. AHP can also be used to simulate the results of potential preventive activities. After the preventive measures have been detected as a result of risk assessment, the AHP analysis is carried out, assuming that the measures have been implemented.

REFERENCES

[1] R. Harvey and M. Mahard, The Preservation Management Handbook: a 21st – century Guide for Libraries, Archives, and Museums, Lanham, Boulder, New York, Toronto, Plymouth: Rowman and Littlefield, 2014, pp. 53.

[2] The Heritage Collections Council, Be Prepared: Guidelines for Small Museums for Writing a Disaster Preparedness Plan, Canberra: The Heritage Collections Council, 2000.

[3] Chien, S.-W., Lien, C.-C., Sie, H.-R. and Song, Y.-T., Disaster Risk Assessment Methods and Response Plans for Cultural Heritage in Taiwan,Collections: A Journal for Museum and Archives Professionals. 8(4), 331–347 (2012).

[4] Muething, G., Waller, R. and Graham, F., Risk Assessment of Collections in Exhibitions at the Canadian Museum of Nature, Journal of The American Institute of Conservation. 44(3), 233 – 243 (2005).

[5] American Museum of Natural History. Risk Assessment. [online] [accessed 12 January 2017]. Available at: <http://www.amnh.org/our-research/natural-science-collections-conservation/general-conservation/documentation/risk-assessment/>.

[6] Elkin, L., Elizabeth Nunan, E. and Fenkart-Froeschl, D., The "Collections Risk Management" Program at the American Museum of Natural History,Collections: A Journal for Museum and Archives Professionals.9(1), 125–138 (2013).

[7] Yau, Y., Multi-criteria Decision Making for Urban Built Heritage Conservation: Application of the Analytic Hierarchy Process, Journal of Building Appraisal. 4(3), 191–205 (2009).

[8] Konsa, K., Books as Artifacts: An Estimation of their Structural Complexity, International Journal of Book. 3(1), 55–64 (2005/2006).

[9] Konsa,K., Kokassaar, U. and Siiner, M. 2004. Microbiological Contamination in Libraries and Archives – Management of Environmental Information, Schimmel - Gefahr für Mensch und Kulturgut durch Mikroorganismen.Stuttgart: Konrad Theiss Verlag, pp. 84–92 (2004).

[10] Gigliarelli, E., Cessari, L. and Cerqua, A., Application of the Analytic Hierarchy Process (AHP) for Energetic Rehabilitation of Historical Buildings. (2011)[online] [accessed 12 January 2017]. Availableat:<https://www.researchgate.net/publication/215587631_APPLICATION_OF_THE_ANALYTIC_HIERARCHY_PROCESS_AHP_FOR_ENERGETIC_REHABILITATION_OF_HISTORICAL_BUILDINGS>.

[11] Zhou, Y., An Application of the AHP in Cultural Heritage Conservation Strategy for China,Canadian Social Science. 2(3), 16–20 (2006).

[12] AdriFort. Cultural Heritage Adaptive Reuse: a Multicriteria DSS. [online] [accessed 12 January 2017].Availableat:<https://www.adrifortipa.eu/sites/default/files/gestione_attivita_documento/allegati_documenti/5.2.CA'%20FOSCARI%20UNIV.ADRIFORT%20MC%20Tool.instructions.pdf>.

[13] Kutut, V., Zavadskas, E. K. and Lazauskas, M., Assessment of Priority Alternatives for Preservation of Historic Buildings Using Model Based on ARAS and AHP Methods, Archives of Civil and Mechanical Engineering. 14(2), 287–294 (2014).

[14] Chen, J–J., Fang, Z., Wang, J–H. and Guo, X–J., Research on Building Fire Risk Assessment Based on Analytic Hierarchy Process (AHP), Proceedings 7th International Conference on Intelligent Computation Technology and Automation. Washington: IEEE Computer Society, pp. 505–508 (2014).

[15] T. Saaty, The Analytic Hierarchy Process, Pittsburgh: RWS Publications, 1996.

[16] Bottero, M., Comino, E. and Riggio, V., Application of the Analytic Hierarchy Process and the Analytic Network Process for the Assessment of Different Wastewater Treatment Systems, Environmental Modelling & Software. 26, 1211–1224 (2011).

[17] Ahn, B., The Analytic Hierarchy Process in an Uncertain Environment: A Simulation Approach by Hauser and Tadikamalla, European Journal of Operational Research. 124 (1), 217 – 218 (2000).

[18] D. Baker, Bridges, D., Hunter, R., Johnson, G., Krupa, J., Murphy, J. and Sorenson, K., Guidebook to Decision-making Methods, U.S. Department of Energy, 2001.

[19] Saaty, T., The Analytic Hierarchy Process and Analytic Network Processes for the Measurement of Intangible Criteria and for Decision-making, Multiple Criteria Decision Analysis State of the Art. New York: Springer, pp 346–407 (2005).

[20] Ramanathan R., A Note on the Use of the Analytic Hierarchy Process for Environmental Impact Assessment, Journal of Environmental Management. 63, 27–35 (2001).

[21] Ishizaka and P. Nemery, Multi-Criteria Decision Analysis: Methods and Software, Chichester: John Wiley & Sons, Ltd, 2013, pp.28.

[22] Saaty, R., The Analytic Hierarchy Process – What it is and How it is Used, Mathematical Modelling. 9(3-5), 161–176 (1987).

[23] Tsamboulas, D., Yiotis, G. and Panou, K., Use of Multicriteria Methods for Assessment of Transport Projects, Journal of Transportation Engineering. 125(5), 407–414 (1999).

[24] Sperantza, Ch., Papadimitriou, M. and Pournou, A., Risk Management: a Case Study of the Wooden Collection Held in Storage at the Folk Art Museum of Athens.[online] [accessed 12 January2017].Available at:

<https://www.researchgate.net/publication/273789030_Risk_management_a_case_study_of_the_wooden_collection_held_in_storage_at_the_folk_art_museum_of_Athens>.

AUTHORS' BIOGRAPHY

KurmoKonsaisan, Associated Professor at the Department of Archival Studies at theUniversity of Tartu, and Professor of Conservation at Tartu Art College. HeownsanM.Sc in microbiology from the University of Tartu, and an MA in BookSciencefrom Tallinn University. KurmoKonsa holds a doctoral degree in Informational Science from Tallinn University. Hisdoctoralworkfocuses on preservation of writtenheritage and preservationsurveysissues. In thepasthehasworked at Tartu UniversityLibraryaspaperconservator and at Estonian PostalMuseumasconservator and curator of collections.

Kaie Jeeser, has a diploma in history and a Master'sdegree (MA) in InformationManagement, the University of Tartu. Kaie Jeeserhasover 20 years of experience in the field of museum documentation. In this field one of the her biggest project has been computerizing documentation work at Estonian museums and implementing a computer-based system into everyday museum work. Currently she has the Head of the Collections Department, Tartu City Museum, Estonia. In addition she is Information Management Specialist Institute of SocialStudies, University of Tartu.