Development of a Methodology for the Design and Management of Academic Strategy – A Holist Approach using Multi-criteria Analysis Techniques

Manolis Chalaris, Stefanos Gritzalis, Cleo Sgouropoulou and Manolis Maragoudakis

Abstract—Aim of the current research paper is to propose an innovative solution for the problematic of the holistic management of an academic strategy. The systematic bibliographic surveys conducted showed that the combination of BSC method together with a multitude of MCDA techniques constitute the most important tools for this issue. Thus, we propose a holistic process-based methodology for the management of an academic strategy which spans from its design and oversight, to interpretation issues of the academic classification of departments of Universities or between Universities where assembly bodies (Quality Assurance Unit, HAHE) are active. We claim that our methodology is of particular importance and that its use will highlight the operational quality of well organised Universities.

Index Terms—Academic strategy, BSc, MCDA, Process based approach

I. INTRODUCTION

The overall assessment of the design and management of an academic strategy as well as the interpretation of the classification of academic performance, constitutes admittedly a complex issue as a multitude of factors will need to be considered. Namely these are strategic decisions that are being taken at the highest level of academic administration. Each Higher Education Institution (HEI) fulfills to a different extent the criteria set in Greece by the Hellenic Authority for Higher Education (HAHE) however no Institution meets adequately the entirety of the criteria. The fulfillment of the qualitative criteria can either be subject to quantitative numbers that are defined by structured processes or in numbers whose assessment is subject to the experience and opinion of the decision makers. The latter are to a certain degree semi structured or even unstructured processes. The problem of management of academic strategy is therefore a multidimensional, complex decision problem whose solution depends on both qualitative and quantitative data and which, like any human decision, is characterized by considerable subjectivity. It therefore follows that in cases where the decisions for the academic strategy are either not adequately documented or

not documented at all, it is deemed necessary to dissect the value system of the decision maker and to verify his/her decision against the criteria he/she invoked.

According to the literature review we performed, BSC alone or combined with other strategic management techniques as well as various types of multiple-criteria decision analysis (MCDA) are methodologically successful tools for the design and management of an academic strategy. To this day, how this can be actually applied in practice has only partially been highlighted in international bibliography relevant to the solution of some aspects of the plexus “Design, Implementation & Monitoring of the academic strategy of a University”. The aim of our paper is to synthesize the preexisting knowledge on the subject into a holistic methodology and to add to it the aspect revealed to us by the values system of those determining the academic performance of a University’s department or comparing those of many Universities. Especially when these are not satisfactorily documented and therefore call for interpretation and verification. Such endeavor has yet to be published in the international bibliography which is indicative of the contributing potential of this paper.

In our effort to determine an optimal solution for the academic classification of the departments of a single University or a multitude of Universities we used the UTASTAR method of the Preference Disaggregation Approach (PDA). The latter assumes that the decision maker reaches to his/her decision based (consciously or unconsciously) on a certain values system and preferences. It analyses the relationship between the decisions and the performance of the alternatives against the criteria and thus it detects the way through which these decisions are taken by developing a criteria synthesizing template. Essentially, the difference from other multiple-criteria approaches (multi-criteria value, dominance relations) lies on the fact that the latter synthesizes the data of a given problem in order to reach to a final result, while PDA analyses data in order to identify the template which best reflects the values system and preferences of the decision maker. In order to accurately determine the template in question the collection of information relevant to the values system and preferences is required. Additionally, the collection and analysis of a sufficient data set of examples of decisions taken by the decision maker needs to be performed. This information usually consists of the actual decisions without any further parameter as to how these were taken and are manifested in various forms such as a monotony scale (classification and taxonomy of alternatives) or through an indicator (the amount of times that an alternative is preferred over others).

Published on December 19, 2020.
M. Chalaris, University of the Aegean, Samos, Greece.
(e-mail: manoschalaris@yahoo.gr)
S. Gritzalis, University of Piraeus, Piraeus, Greece
(e-mail: sgritz@unipi.gr)
C. Sgouropoulou, University of West Attica, Aegaleo, Greece
(e-mail: csgouro@uniwa.gr)
M. Maragoudakis, Ionian University, Greece
(e-mail: mmarag@ionio.gr)

The examples can be previous decisions taken, a small but representative set of imagined alternatives or a small but representative subset of the alternatives under consideration which are clearly outlined by the decision maker.

For the purpose of this paper we shall briefly refer to relevant bibliographical data, we will present the steps of the methodology which we propose for a holistic management of an academic strategy, we will make mention to its previous partial application in relevant papers of ours and finally reach to our conclusions.

II. LITERATURE REVIEW

The international bibliography is rich with cases where the BSC & MCDA techniques are applied in numerous sectors of economic and societal areas of activity of organisations, businesses and Universities. For the purpose of this paper however, we will only focus on the most prominent bibliography relevant to the management of academic strategy.

The paper of Fahmi Fadhl et al. [1] examines studies in renowned journals focusing on the Balanced Scorecard in Higher Education Institutions technique. This review showcases the potential application of BSC in Universities. In her paper [2] M. Hladchenko focused on the comparative analysis of the Balanced Scorecards of four higher education institutions and aimed at determining a general BSC framework for the latter.

The authors V. Umashankar & K. Dutta focus their study [3] on the Balanced Scorecard (BSC) and present the way through which it should be applied on higher education institutions in India. Their paper is based on existing bibliography relevant to the notion of Balanced Scorecard as well as on its application in higher education. The paper by M. Peris-Ortiz et al. [4] presents the adoption of performance measuring systems by some Latin American Universities as tools for strategic oversight. As such the Balanced Scorecard (BSC) was selected. The paper by C. Papenhausen & W. Einstein [5] showcases the increasing tendency of United Kingdom Universities to implementing performance management. In his article [6], D.F. Beard presents a series of successful implementations of BSC in Universities throughout the world. From the bibliography as well as the study of specific success stories it becomes evident that BSC can be used by higher education institutions not only for quality oversight purposes but also for the improvement of the Universities management. In the paper of F.F. Al-Hosaini & S. Sofian [7], which is of particular importance to us, a concise bibliographical analysis relevant to the application of BSC in Universities in its four contextual dimensions is presented.

There are indeed numerous research papers focusing on the combined applications of the MCDM and BSC methods in various areas, but very few of them focus on the evaluation of Universities. Hashemkhani, Zolfani and Radfar (2011) presented a review article concerning the selection of the best hybrid models of the MCDM and BSC methods [8]. The results indicate that ANP and VIKOR are superior to AHP and TOPSIS combined with BSC, while DEMATEL is suitable for the calculation of the cause and effect relations between the BSC perspectives. The bibliography review also revealed that in many researches the MCDM methods

used (Fuzzy) AHP, (Fuzzy) ANP for the calculation of the indicator's weight (Dytczak & Ginda 2009 [9], García, Melón et al. 2010 [10], Azimi et al. 2011 [11], Timoshenko 2008 [12]) while in other researches conducted, the DEMATEL method was used based on the cause and effect relationship between the perspectives and the indicators.

In the study of H. Zolfani, and S. Ghadikolaei, A. [13] three MCDM methods were applied in combination for the assessment of private Universities. Initially DEMATEL was used to assess the cause and effect relations between BSC perspectives, the next step consisted of the application of ANP for the identification of the important criteria and their weight while in the end VIKOR was applied so as to compare selected Universities as study cases and for their classification.

Finally, in our recent paper [14] the combined application of the BSC and Utastar techniques was attempted for the first time. This in an effort to interpret the decision makers' reasoning as well as the revelation of their values system regarding the classification that they conducted in seven Greek Universities according to selected criteria of their Internal Quality Assurance Systems.

III. PROPOSED HOLISTIC METHODOLOGY FOR THE DESIGN AND MANAGEMENT OF ACADEMIC STRATEGY

Prior to outlining our methodology, we shall make mention to some of its core aspects.

In order for the BSc to be applied in the higher education area [15] the most useful measurements corresponding to its four dimensions need to be defined. Obviously, in order to set out an exhaustive strategy for a University it will be necessary to firstly record its strongest points and identify those that call for improvement, subsequently these should be counterchecked against threats and opportunities present in its field of action, determine how its "competitors" operate and what services will be worth adopting so as to attain its goals (SWOT ANALYSIS). Thus, we reach to the formulation of a strategic map outlining the goals of each dimension of the Academic Scorecard and the required metrics for the attainment of these goals. In order to identify the goals and indicators most suitable to the particular targeting of each University, it is often necessary to make use of widely used strategic management tools which are applied individually or/and in combination, according to each case, such as PVA, QFD, ABC & AHP or ANP etc.

Let us note at this point that the key for the successful application of BSc is the appropriate selection of the indicators and their correct weighting so as to determine the extent to which each indicator effects the overall strategic goal. This particular aspect is totally ignored by Greek Higher Education Institutions while the overseeing authority (HAHE) does not provide any relevant guidance within the context of the formers' independence.

By applying the Analytic Hierarchy Process in the development of the Balanced Scorecard this goal can to a great extent be attained. The application takes place in two stages, during the first one the most important Key Indicators are chosen while in the second stage the weighting factors of the indicators participating in the

development of the BSc are determined [16]. In particular: During the First Stage the most important Key-Indicators are selected, these are determined through the application of methods such as SWOT Analysis, Quality Functioning Deployment and Product Value Analysis etc. As it was previously mentioned, in the Second Stage the statistical weights of the indicators applied in the BSc will be calculated. This process takes place in two levels. The first Level concerns the hierarchization of the four basic aspects of the BSc and the designation of the coefficients with which the aspects will be included in the final table. While the second Level concerns the calculation of the statistical weighting of the Key-Indicators of each aspect of the BSc independently. The AHP method predisposes that the factors that are present in the hierarchical structure are independent from one another. Should this not be the case it is necessary to employ the analytic network process (ANP) [17]. Many decision related problems cannot be hierarchically structured since they include the interaction and dependence of the high-level factors in lower level factors [18]. ANP usually analyses the relevant weights of the performance indicators.

The methodology we propose “Holistic Process-based Methodology for the Management of Academic Strategy – From the Design to the revelation of the rationale of decision makers” contains the steps outlined below (see also Fig. 1):

1. Identification of Problem in Developing and Overseeing Academic Strategy.
2. Development of Balanced Scorecard
 - 2.1 Design of Academic Performance Card
 - 2.1.1 Precise definition of Vision and Mission
 - 2.1.2 Definition of the Strategic Dimensions applicable in the academic area
 - 2.1.3 Definition of strategic goals and success factors through the use of SWOT analysis
 - 2.1.4 Creation of the Strategic Map
 - 2.1.5 Compatibility check between the Academic Performance Card and the Mission
 - 2.2 Definition of the key performance indicators (kpis) that will be included in the Academic Performance Card and their level of importance.
 - 2.2.1 Bibliographic Research for the identification of quality indicators
 - 2.2.1 Collaboration with experts for the definition of kpis
 - 2.2.1 Use of strategic tools (i.e. PVA, QFD), for the identification of key performance indicators
 - 2.2.2 Identification of Strategic Goals Quality Indicators
 - 2.2.3 Application of Multi-criteria Analysis techniques (MCDM)
 - 2.2.3.1 Implementation of a suitable technique for specifying Cause and Effect relationships in the aspects/dimensions of A.P.C (i.e. DEMATEL)
 - 2.2.3.2 Implementation of a suitable technique for specifying the weighting factors of the quality indicators and their classification based on importance (AHP or ANP)
 - 2.2.4 Possible amendment of Strategic Map
 - 2.2.5 Definition of the Actions for the attainment of strategic goals and the metrics of the Key Performance Indicators.

3. Implementation of Multi-criteria Analysis (MCDM) techniques for reaching to a decision or for the interpretation of an academic strategy decision.

WHEN THE DECISION IS TO BE TAKEN

3.1 Implementation of a suitable technique for the classification of the alternative proposals (University or Academic Departments) (i.e. VIKOR)

3.1.1 Presentation of the Final Classification Results

WHEN A DECISION HAS BEEN TAKEN WITHOUT ADEQUATE DOCUMENTATION

3.2 Implementation of the UTASTAR method for the revelation of the knowledge-based values system and for the interpretation of the decision maker's behavior

3.2.1 Results from the implementation of UTASTAR

3.2.1.1 Criteria Weighting

3.2.1.2 Evaluation of key performance indicators

3.2.1.3 Evaluation of utility functions

Fig. 1. Steps of proposed methodology for a holistic management of an academic strategy

We deemed it necessary to take a process-oriented approach in describing our methodology by using the BMP software ADONIS Community Edition 3.0, so as to allow for the possibility to include the entirety of all its modeling aspects (who does what and with what necessary documentation, timing of processing each step, required human and material resources, involved IT systems etc.) and thus enable the analysis of our models as well as the implementation of their simulation for an academic term. Of course, to this day we do not possess all the parameters so as to be able to complete our modelling.

IV. AN ATTEMPT IMPLEMENTING BSC WITHIN THE GREEK CONTEXT

As the bibliographic survey we undertook confirms, it becomes evident that parts of the methodology we proposed in the previous chapter have already been implemented as stand-alone applications and have been presented mostly as research papers in journals and conferences.

For this exact reason we have made the decision to focus on until recently unpublished (in Greece or abroad) aspects of our methodology. Subsequently we briefly refer to two recent paper of ours that come to fill research gaps. The first [19] relates to Greece and was presented during the CIE 2020 conference while the second concerns the combined application of BSC & Utastar [14] and is indeed considered as an important contribution as it comes to fill a research gap.

In particular, in [19] we attempt at managing the academic strategy of a Greek Higher Education Institution through the use of the Balanced Scorecard technique. The implementation of the aforementioned technique is performed with actual data. These resulted from the operational planning of a Greek University which following a series of meetings and consultations with its Quality Assurance Unit, Rectoral Authorities, the Deans of the faculties and the Presidents of the Academic Departments, specified the strategic goals of the University, defined the performance indicators and set the actions necessary for their attainment. Finally, they agreed on the desired academic performances for the following academic period. The abovementioned strategy along with its defining dimensions were approved by the Senate and were then forwarded to HAHE for the needs of certification of the Internal Quality Assurance System.

In developing all the stages and models of the academic performance scorecard we utilized the specialized software ADOSCORE 2.0 developed by the Austrian company BOC S.A. The software in question is considered to be among the best when it comes to applying the BSc technique and it is widely used especially in German speaking countries. By using ADOSCORE 2.0 we followed the classic modelling and documentation generation methodology.

While being aware that this attempt does not constitute - especially in our times - an extraordinary research based contribution at an international level (taking into account similar efforts by foreign Universities), it is worth mentioning that no similar endeavor has ever been applied or published to this day in any Greek University. Therefore, through this chapter of our paper we present an innovative approach for Greece as well as a sample of empirical

application of the theory which can be easily adopted.

In Fig 2 we present one of the most important modelling diagrams of our endeavor, which is the Cause and Effect Model of the Greek University in Attica. In this model we can monitor all strategic goals of the institution and the performance indicators that measure them in the four dimensions of its BSc.

Fig. 2. Cause and Effect Model of a Greek University.

In our other work [14], we attempt to apply the last part of our proposed methodology regarding the combination of the BSc technique with the aggregation disaggregation theory of the Multiple Criteria Analysis. Specifically, we used the UTASTAR algorithm [21], [22] in order to reveal the cognitive style and the behavior of the decision maker whose task was to assess and rank the strategic performance of seven Greek universities. For the evaluation of the strategic performance we used 26 key performance indicators that are developed and proposed by the Hellenic Quality Assurance and Accreditation Agency.

In the following paragraphs we present the main outcomes of the application of UTASTAR algorithm which concern the definition of the criteria Weights (Fig 3) and the performance of the kpis in each dimension of the BSc (Fig 4).

The definition of the criteria weights will reveal which key performance indicator of each dimension are most important for the decision maker for the assessing the

academic strategic performance and thus for implementing educational policies.

Fig. 3. Criteria Weights for each dimension of Balanced Score Card

As we can see on Fig 3, the most important criterion for the decision maker regarding the education dimension is the average number of students per undergraduate study program, following by the scholarships that is important kpi because it can affect positively other dimensions of the BSCs, and the studies duration that consumes economic budget from the university affecting its financial performance. On the other hand, criteria like the number of Erasmus students and the degree grades are not crucial for the decision maker.

In the personnel dimension, the key performance indicator that plays the most important role according the preferences of the decision maker, is the criterion of professors' ratio per student and second the professors' ratio per undergraduate study programme. These two criteria can be considered as crucial factors for a university regarding his productivity in terms of academic excellence and competitiveness among other institutions. The other criteria of this dimension seem to be not so important for the decision maker.

In the other two dimensions, a brief analysis of Fig 3 depicts that the number of PhDs and the number of citations for the research dimension and funding through ESPA for the financial dimension are the most important factors for the decision maker in order to assess and further rank the academic performance of the universities and more over to draw strategic actions.

As we mentioned before, another useful outcome of the algorithm is that it depicts the performance of kpis in each dimension of the BSC (Fig 4).

Fig. 4. Performance Scores of KPIs for each BSC perspective

At this point we must clarify, that the performance scores are normalised between 0 and 1. As we can see in Figure 4 in the education dimension, the University 4 has the best performance among all Universities following by the University 2. Thus, the other Universities like Univ. 3 and Univ. 6 should take, according the preferences of the decision maker, all necessary actions in order to improve the performance of the kpis that belong to this dimension of the balanced scored.

At the personnel dimension, the University 2 and the University 6 have the best performance since they perform better in criteria's like professor's ratio per student and professors ration per undergraduate study program. On the other hand we observe the worst performance at University 7 and University 3.

Analysing the research dimension we observe that the best performance have the Universities 5, 4 and 2, while the other examined universities should design and implement policies in fields like quality of research, research expenditure, and mainly attract more PhD students in order to improve their position.

Finally, the last dimension that plays an important role in the implementation of the strategy is the financial dimension where it's obvious that the best performance is observed in University 1, University 3 and University 4. Obviously, the decision maker attributes high performance to these Universities because in criteria like ESPA funding they perform better.

Through the for the first time combined application of the BSC & Utastar technique using an actual case study from the Greek Universities domain, we managed to reveal the cognitive and the behavior style of the academic strategy decision maker. Hence, the special value of this methodology is that it can be used by any Quality Assurance Unit or evaluation authority for the academic classification of departments of Universities or between Universities.

V. CONCLUSION

In this paper we posed the problematic of the holistic management of an academic strategy and its handling techniques. The systematic bibliographic surveys conducted showed that the BSC as well as a multitude of MCDA algorithm forms constitute the most important tools for the holistic management of an academic strategy. Additionally, the specific elements and complexities in applying them were revealed. Based on this experience we proposed a holistic process-based methodology for the management of an academic strategy which spans from its design and oversight, to interpretation issues of the academic classification of departments of Universities or between Universities where assembly bodies (Quality Assurance Unit, HAHE) are active. It was found that a research gap exists when it comes to the issue of interpreting academic classification when sufficient documentation is lacking, and the classification is primarily reached empirically. This particular issue was tackled through a combined application of the BSC & Utastar techniques using an actual case study from the Greek Universities domain. Since this case should be viewed as the rule of thumb for most Universities (the application of numerous MCDA steps is considered a

luxury), we claim that our methodology is of particular importance and that its use will highlight the operational quality of well organised Universities.

REFERENCES

- [1] Fahmi Fadhl Al-Hosaini & Saudah Sofian «A Review of Balanced Scorecard Framework in Higher Education Institution (HEIs)», *International Review of Management and Marketing*, vol. 5, pp.26-35, 2015.
- [2] M. Hladchenko, Balanced Scorecard - A strategic management system of the higher education institution. In: *International Journal of Educational Management*, Vol. 29, pp. 167-176, 2015.
- [3] V. Umashankar & K. Dutta « Balanced Scorecards in Managing Higher Education Institutions: An Indian Perspective. *International Journal of Educational Management*, 21, p.p. 54-67, January 2007.
- [4] M. Peris-Ortiz, D. García-Hurtado & C. Devece, Influence of the balanced scorecard on the science and innovation performance of Latin American universities, *Knowledge Management Research & Practice*, 17:4, 373-383, 2019
- [5] C. Papenhausen, & W. Einstein, "Implementing the Balanced Scorecard at a college of business", *Measuring Business Excellence* 10(3):15-22, 2006.
- [6] D.F. Beard, «SUCCESSFUL APPLICATIONS OF THE BALANCED SCORECARD IN HIGHER EDUCATION», *Journal of Education for Business* 84(5):275-282, May 2009.
- [7] Al-Hosaini F.F.& S. Sofian «A Review of Balanced Scorecard Framework in Higher Education Institution (HEIs)», *International Review of Management and Marketing* 5 (1), 26, 2015.
- [8] S. Hashemkhani Zolfani, Radfar, I., "A research on hybrid models of BSC and MADM methods for selecting the best hybrid model", *American Journal of Scientific Research* 36: 83-89, 2011.
- [9] M. Dytczak, G. Ginda, "Identification of building repair policy choice criteria role", *Technological and Economic Development of Economy* 15(2): 213–228, 2009.
- [10] M. García Melón, T. Gómez Navarro, S. Acuña Dutra, "An ANP approach to assess the sustainability of tourist strategies for the coastal national parks of Venezuela", *Technological and Economic Development of Economy* 16(4): 672–689, 2010.
- [11] R. Azimi, A. Yazdani-Chamzini, M. Fouladgar, E. K. Zavadskas, M. Basiri, "Ranking the strategies of mining sector through ANP and TOPSIS in a SWOT framework", *Journal of Business Economics and Management* 12(4): 670–689, 2011.
- [12] K. Timoshenko, "Russian public sector reform: the impact on university accounting", *Journal of Business Economics and Management* 9(2): 133–144, 2008.
- [13] S. Hashemkhani Zolfani, A. Safaei Ghadikolaei, "Application of MCDM methods in shortterm planning for private universities based on Balanced Scorecard: a case study from Iran", *International Journal of Productivity and Quality Management* 10(2): 250–266, 2012.
- [14] M. Chalaris, S. Gritzalis, "Data on Strategic Performance of Greek Universities during the economic recession: A Multiple criteria Approach", *Data in Brief Journal*, Vol 30, 2020.
- [15] M. Chalaris, I. Chalaris, S. Gritzalis & A. Tsolakidis, "Modeling and Transformation of the Evaluation Mechanism of Greek Higher Education Institutes using Balanced Scorecard Technique", *International Journal on Integrated Information Management*, Vol.02, 2015.
- [16] K. Zopounidis and M. Doubos, "Multicriteria classification and sorting methods: A literature review", *European Journal of Operational Research* 138, 229–246, 2002
- [17] M. C. Lee, "A method of performance evaluation by using the analytic network process and Balanced Scorecard, " *International Proceedings of International Conference on Convergence Information Technology*, IEEE, 235–240, 2007.
- [18] T. L. Saaty, "The Analytical Hierarchy Process (AHP) for Decision Making and the Analytical Network Process (ANP) for Decision Making with Dependence and Feedback", *Pittsburgh: Creative Decisions Foundation*, 2003.
- [19] M. Chalaris, Th. Katsaros, "Managing Academic Strategy of a Greek HEI using the BSc technique – From Theory to Implementation", " *International Proceedings of 12th Conference on Informatics in Education (in Greek)* (to be published)"
- [20] S. H. Zolfani, A.S. Ghadikolaei, "Performance evaluation of private universities based on balanced scorecard: empirical study based on Iran", *Journal of Business Economics and Management*, 14(4), 696-714, 2013.
- [21] Y. Siskos, D.Yannakopoulos, "UTASTAR: An ordinal regression method for building additive value functions", *Investigação Operacional* 5 (1), 39-53, 1985
- [22] Y. Siskos, E. Grigoroudis, N.F. Matsatsinis, *UTA methods, International Series in Operations Research and Management Science*, Vol 233, p.p 315–362, 2016.

Manolis Chalaris graduated from the Department of Mathematics, University of Patras and obtained a Msc in subject "E-Business Management" from the Donau University of Krems in Austria and a second one in "Educational Technology and Human Resource Development" from the National and Kapodistrian University of Athens. He is currently a Ph.D. student in the Department of Information and Communication Systems of University of the Aegean.

Manolis Chalaris works in the Hellenic Authority for Higher Education. In addition, he is an Academic Fellow in the University of West Attica and has also experience from European Projects. His research interests include Business Modelling, BSc, Educational Data Mining, Decision Support Systems, Strategic Management in HEI, Evaluation of Educational Processes and Quality Assurance in HEI

Stefanos Gritzalis is a Professor of Information and Communication Systems Security, at the Lab. of Systems Security, Dept. of Digital Systems, University of Piraeus, Greece (2019+). He was the Rector of the University of the Aegean, Greece (2014-2018). He has acted as Special Secretary for the Hellenic Ministry for Administrative Reform and Electronic Governance (2009-2012). Previously, he was a Professor at the University of

the Aegean, Greece, School of Engineering, Dept. of Information and Communication Systems Engineering, and member of the Info-Sec-Lab Laboratory of Information and Communication Systems Security (2002-2019). He holds a BSc in Physics, an MSc in Electronic Automation, and a PhD in Information and Communications Security from the Department of Informatics and Telecommunications, University of Athens, Greece. His published scientific work includes more than 10 books (including the book "Digital Privacy: Theory, Technologies and Practices", co-edited by A. Acquisti, S. Gritzalis, C. Lambrinoudakis and S. De Capitani di Vimercati, Auerbach Publications, Taylor and Francis Group) and 34 book chapters. Moreover, his work has been published in 316 papers (135 in refereed journals and 181 in the proceedings of international refereed conferences and workshops). He has co-authored papers with more than 130 researchers from 30 countries during the last 28 years. The focus of his publications is on Information and Communications Security and Privacy. His most frequently cited papers have more than 7.000 citations, h-index=46, i10-index=143, as measured by Google Scholar. He acts as Area Editor for the prestigious "IEEE Communications Surveys and Tutorials" journal (IF=23.7 ranked 1st in Telecommunications and Computer Science domains). He is the Editor-in-Chief or Editor or Editorial Board member in 35 journals and a Reviewer in more than 78 scientific journals. He has acted as Guest Editor in 35 journal special issues, he has been General Chair or Program Committee Chair in more than 50 international conferences and workshops, he has served as a Program Committee member of more than 574 international conferences and workshops.

Cleo Sgouropoulou (Mrs.) is a Professor at the Department of Informatics and Computer Engineering, University of West Attica, Greece. She is dedicated in pursuing and carrying out R&D activities in the fields of design, development and standardization of Learning Technology, Academic and Research Information Systems, constantly building and leveraging strong international synergies. She has leaded several institution-wide, national and European digital transformation initiatives related to the design and development of EdTech systems and services for HE and VET, focusing on Open Educational Resources (OER), educational taxonomies, learning outcomes, competence and skills models for strengthening VET, mobility and training to employment pathways, open data and learning analytics, implementation of data-driven assessment and quality assurance approaches. Prof. Sgouropoulou is the Coordinator of the Greek Mirror Committee of the Hellenic Organization for Standardization (ELOT)

TC48/WG3 and the Head of the Greek delegation to the European Standardization Committee (CEN) TC 353 "ICT for Learning, Education and Training (LET)" and to the ISO JTC1 SC36 International Committee "Information Technology for Learning, Education and Training".

Manolis Maragoudakis Professor in the Ionian University, Department of Informatics. He obtained his diploma in computer science from the Computer Science Department, University of Crete in 1999. He joined the University of Patras, Department of Electrical and Computer Engineering in 2000 and he obtained his Ph.D. in artificial intelligence in 2005. The thesis was entitled "Reasoning under uncertainty in dialogue and other natural language systems using Bayesian network techniques". His research interests include data mining, artificial intelligence, machine learning, natural language processing and user modeling. Post-doctoral research: "Extraction of Hierarchical Ontologies from textual web corpora", funded by the Greek government under the PYTHAGORAS-II: Support for research groups within universities".