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RESEARCH ON REAL ESTATE**

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# 1. Building Projects

### 1.1. Project models vs. building projects' outcome – a strategic test

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**Purpose:** In most countries, public procurements are subject to comprehensive regulations through laws and regulations of the law. This is particularly the case for substantial public sector investments such as construction or renovation of buildings. Compared to public administrations, private enterprises usually have far more room for manoeuvre when they sign contracts for construction or renovation of buildings. The question is thus whether project models influence building projects' outcome. Can alternative project models for public building projects facilitate increased value creation for taxpayers and users of public buildings? **Design/methodology/approach:** The present research is based on a national online survey in Norway from June to September 2016 (N = 1034). The questionnaire was developed together with important stakeholders, and pretested on actors involved in building projects. The sample was non-random; the respondents were invited through several business associations and the research project's consortium. The respondents (80 per cent men and 20 per cent women with an average of 15 years' professional experience with building projects) are representative for those involved in Norwegian private and public sector building projects. The dataset includes data about 975 construction projects and permit strategic tests of hypotheses concerning project models and project outcomes. The data have been analysed with IBM SPSS version 23. **Findings:** Public administrations use far more open tenders and less direct orders ( $p < .05$ ). Open tenders have higher frequency than expected of average project outcomes. Private enterprises use less open tenders and more closed tenders and direct orders ( $p < .05$ ). Closed tenders have higher than expected frequency of better than average project outcomes. Municipalities and county municipalities use more fixed price contracts and less fixed price contracts with incentives and time and materials contracts, and also use PPP/lease contracts. Fixed price contracts have higher frequency than expected of average project outcomes. PPP/Lease contracts have slightly higher frequency than expected of better than average project outcomes. Private enterprises use more fixed price contracts with incentives and target price contracts with gain sharing. Fixed price contracts with incentives have higher frequency than expected of better than average project outcomes. **Research limitations/implications:** This is a large N survey among Norwegian public and private sector professionals involved in building projects. The results may have a slight success bias since more than 50 percent of the projects were reported to perform above average. **Originality/value:** Public procurements in most European countries are subject to EU regulations. Alternatives to the current public sector procurement and project model regime may thus be of interest for a large a number of citizens and taxpayers.

**Keywords:** Building projects, Project models, Outcome

## 1.2. Value sharing model for urban development

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**Purpose:** The purpose is to develop models for urban and design urban settlements that generate shared value creation for community, users and commercial actors-over time. The background for the project is the recognition that there is a clear correlation between the design of the built environment, individuals ' quality of life, the community's social structure and business development. Extensive research shows that the development of urban areas must be linked more closely to an understanding of the development of financial sustainability as a consequence of societal improvements as reduced inequality and lack of inclusion. Lack of understanding of this context leads to cities and towns as in far less than desirable capabilities to create value for the residents, the business world and society as a whole. **Design/methodology/approach:** The research is a literature review from the fields of facility management, urban design, economy, business models, social security, technology and ethics. **Findings:** The model of urban value ecosystem is based on an open governance model, active community involvement and new business orientation to share the value with citizens. Within the process of creating the urban value ecosystem, and changes toward healthier and happier environment, the role and complexity of facility manager is important to see, as the main facilitator of changes. Here, the urban facility manager is seen in accordance as the one to initiate and support the changes for better interaction with the built environment, and toward enabling the health, well-being and quality of life of the world's societies and population through services it manages and delivers. **Research limitations/implications: / Originality/value:** The value is to see the benefits of 'social economy' to enrich the societal groups (employees in companies, residents in residential places, owners of the flats in buildings, users of public buildings etc.), change the business model (urban value capture model), modify forms of management (more proactive role for FM in the urban context) and initiate new services for FM. The last should be oriented toward social responsibility, giving a better understanding of the societal effect of using collective impact as an objective of city development.

**Keywords:** Building projects, Project models, Outcome

### 1.3. Building performance optimization considering values beyond energy cost saving

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**Purpose:** The purpose is to develop a simulation-based optimization algorithm for sustainable building design, in which individual/social values beyond energy cost saving can be captured. The research seeks for the integration of two fields, one of the multi-objective optimization of the building energy performance, and the other value characteristics of buildings and environment, as a perceived value for individuals and society. The questions of this research are: which of the qualitative value characteristics are important for the perceived value of the existing building (adaptability, usability, space utilization, maintainability etc.), how to measure them from the real estate value perspective (before and after the sustainable refurbishment); how to incorporate them in the mathematical model; how high are their importance regarding creating value for the users. **Design/methodology/approach:** To answer those questions, we prepared a combination of literature review from the fields of facility management, urban design and business models, and algorithm modelling. **Findings:** A multi-objective optimization algorithm is developed for optimizing building design considering values beyond energy cost saving. At this stage the building performance simulation model includes many of building performance characteristics, like energy intensity, and thermal comfort, but we can learn that energy performance contract were not successful enough, due to different factors. One of them is also that the value contribution should include not only technical performance indicators, but also individual and social value ones. **Originality/value:** The value is to find the casual factors for changing the behavior toward more responsible sustainable behavior.

**Keywords:** Building projects, Project models, Outcome

#### **1.4. Added to building projects group. The role of semi-private transitional space in stimulating social interaction in high-rise apartment**

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Spatial characteristics of residential area can have an influence on, and in some cases define the content and form of, social interactions (Kruse, 1974). In high-rise apartments, residents encounter many more co-residents, but have fewer friendships than ones in low-rises do (Gifford, 2007). Therefore, social interaction is more difficult for residents to regulate, which can lead to withdrawal, loss of community and social support. Previous studies have shown that the defects of high-rise buildings spring from the poor social quality of "intermediate spaces" that are criticized as weird, anonymous spaces (Dalziel, Cortale, 2012; Modi, 2015). Intensive interaction can only develop in buildings where individuals are provided with appropriate 'secondary' territory, which are spaces beyond an individual's primary or private territory (Altman, 1975). It is necessary to provide a gentle transition from the front door of each apartment unit to the public space outside and to the upper floors of the building to stimulate encounters between residents (Dalziel, Cortale, 2012; Maliki, Abdullah, Bahauddin, 2014; Modi, 2015; Ghazli, Khan, 2016). Purpose of the research: This research aims to identify to what extent social interaction takes place between residents of high-rise apartments and determine how the design of semi-private transitional spaces stimulate social interaction. Methods: This paper conducts a comprehensive overview of interactional spaces and their characteristics in high-rise apartments. Furthermore, it will draw upon a literature review regarding the influence of relevant architectural characteristics of high-rise apartments, particularly of the semi-private transitional space, on social interaction. Conclusions & Discussion: Social spaces are better developed in the horizontal direction, however with their large footprints, vertical social connectors would be an alternative. Studies on social cohesion indicate that people from all ages (Gang, 2015) and cultures (Altman, 1977) desire social interaction, as it is part of being human. Therefore, high-rise apartments need to respond to these desires by "becoming social connector themselves" (Jo, 2005), in which the potential of transitional spaces should be considered for stimulating chance encounters (Jo, 2005; Aw, Lim, 2016). The relative importance of spatial characteristics and the hierarchy of spaces for influencing social interactions in semi-private transitional spaces in high-rise apartments needs to be further investigated.

**Keywords:** High-rise apartment, Informal meeting opportunities, Semi-private transitional spaces, Social interaction, Social cohesion, Stimulation

## 2. Climate Change

## 2.1. The Impact of Climate Change on Strategic Management of River Dam Assets

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The purpose of this paper is to discuss the impact of Climate Change (CC) on strategic management of River Dam Assets and to provide an overview of ongoing research related to this topic, particularly regarding the adaptation of these assets. The scientifically verified CC scenario, later on, articulated through United Nation Intergovernmental Panel on Climate Change (UNIPCC) and Conference of Parties 21 (CoP21), foresees severe, devastating alterations of hydrological regimes of watercourses in the coming decades. They have an impact on the environment and the society, particularly river dams, which were not designed to meet these changes. So far, extensive climate data has been collected over the past 100 years. In the paper, relevant research data, findings, policies, legislation, impacts and consequences from EU member states are presented and interpreted through descriptive methods. Furthermore, relevant asset management research regarding adaptation and mitigation of CC impacts and consequences on river dams is provided, including human relation to real estate covering technical, social, psychological, historical and economic influences. Although extensive CC research has been carried out, only a few research deals with the impacts of CC on dam safety, including management and adaptation of these assets. Well understood impacts of CC in correlation to adequate asset management policy can ensure effective adaptation of these assets to CC. This paper provides an overview of existing research needed to draw further conclusions about the impacts of CC on river dams. This paper is the first of this kind in Slovenia and one of the first in the broader scientific community. Nevertheless, further research is needed to establish whether it is possible to generalise this paper's findings.

**Keywords:** Climate change, Assets management, River dam, Safety, Mitigation measures, Adaptation



## 2.2. Pro-environmental behavior in urban settings

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Pro-environmental behavior is a complex issue that is still not fully apprehended. In the article we try to identify what shapes an individual's predisposition to adopt pro-environmental behaviour. In contrast to traditional pro-environmental behavior measures, such as recycling, buying used goods etc. we are focused on the behavior in urban settings that has larger environmental impact. Such actions are classified into three broad categories of pro-environmental behavior: green purchases, which mean the purchase of recycled goods or non-toxic substances, good citizenship, that is the minimisation of energy consumption, water conservation, along with the reduction of waste production and promotion of recycling, and environmental activism, which includes environmental group membership. Each of these categories consists of three factors, namely sociodemographic factors, personality traits and attitudes toward the environment. In the study, we aim to establish the interconnections of all these variables and postulate a hypothetical model of pro-environmental factors in urban places.

**Keywords:** Pro-environmental behavior, Behavior measures, Sociodemographic factors, Personality, Attitudes, Urban settings

### 2.3. Lack and excess of heat versus air pollution in Pristina

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The aim of paper is to highlight relationship between lack/excessive heat with air pollution in Pristina! Lack of heat offered by district heating system in Pristina "Termokos" in some Pristina's buildings in one side and excess of heat in other side should be main driving force for establishing a retrofit or refurbishment of district heating system in Pristina. This will result with less pollution and lower bills for energy consume. Researches will deal with some of existing problems appeared on central heating system in Pristina Heating district and possibilities to solve those problems. How does this problem effect energy efficiency and environment degradation? Through questionnaire, it will be measured satisfaction of district heating consumer's with offered services and bills. There are done some improvements on primary piping system, but, without having an overall refurbishment, so the problem was not solved! Through measurement of inner and outer air temperature and air relative humidity it will be shown importance of interventions on secondary piping system! Here will be presented three apartments of three same age different buildings, but, with different state! So, first category of apartments represent apartments with old wooden windows and old nonworking radiator valves, second category apartments with new PVC windows and nonworking radiator valves and the third apartments category includes apartments with new PVC windows and thermostatic radiator valves! The methodology and tools are a result of case study and questionnaire and literature review study.

**Keywords:** Air temperature, Air humidity, Living room, Piping system, Fresh air

## **2.4. Multi-Level Climate Effect Modeling, best management practices From private property to national level**

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The changing climate has an effect on the quality of life in our cities: heavier rainfall (resulting in floodings), longer periods of drought, reduced air and water quality and increasing temperatures in cities (heat stress). Awareness about these changes among various stakeholders is of great importance. Every Dutch region is required to perform a stresstest indicating the effects of climate change (o.a. flooding and heatstress) before 2020. The level of execution, area size and level of participation of stakeholders, has intentionally been made flexible. To provide more insight into the approaches and best management practices to climate resilience, this article provides 3 examples of stresstests performed on several levels: single object real estate level, city level and national district level. The method 'stresstesting', involves flood and heatstress modeling, defines the current status of climate adaptation characteristics of an object, city or district. The stresstest form the base line and starting point for the national 3 step approach adaptation strategy 'analyse, ambition and action'. The 3 pilots have been evaluated as 'successful' by stakeholders and yielded a significant amount of valuable information, further improvement is recommended as increasing the participation of the private sector, in a 'quadruple helix approach'. The learning points from these 3 examples of stresstests will subsequently be implemented in the form of improved stresstesting in the near future in (inter)national cities around the world.

**Keywords:** Climate adaptation, Heatstress, Floodmodelling, Real estate

## 3. Construction

### 3.1. Dark Side of Boosting Building Renovation in European Real Estate Market

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Background: About 75 % of buildings in EU are energy inefficient and, depending on the Member State, 0.4-1.2% of the stock is renovated each year. Article 5 of Directive 2012/27/EU explicitly states: *“from 1 January 2014, 3% of the total floor area of heated and /or cooled buildings owned and occupied by its central government is renovated each year.”* The present day extensive renovations are going in wrong direction, towards narrow-minded measures with thermally well insulated and air tightened building envelope, and highly efficient mechanical systems. Such non-holistic approach results in minimized building energy use and uncomfortable and unhealthy conditions as well as other negative health-related outcomes. This problem is recognized in *Explanatory Memorandum* of the new EPBD 2016 proposal, where health problem is explicitly quoted. Purpose of Study: Our discussion is focused on general policy of health and comfort position in the framework of energy efficiency of buildings. It is based on relevant case studies of renovated public and residential buildings. Sources of Evidence: Comprehensive overview of European legislation, analyses of case studies (inspection, measurements, simulations). Main Argument: Deteriorated indoor environment quality in analysed buildings present collateral damage of performed energy renovations and constructions. The detected causes are mainly self-sufficient subjects involved in current design process, missing multidisciplinary approach, deficiencies in legal requirements, non-bioclimatic and non-holistic design of building as a whole, constructional products, complexes and its` systems. Conclusions: Recommendations can be used in national politics and strategies in all stages of healthy and energy efficient design of buildings.

### 3.2. Key ethical challenges to Urban FM

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**Purpose:** In this conceptual paper, we outline the key challenges of an ethical nature that face 1) the concept and realisation of sustainable behaviour in urban areas and 2) the role of so-called FM in activating it. Emphasis is laid on challenges stemming from fundamental structures of the construction industry as a whole, and the consequences of these for sustainable living in the future built environment. **Methodology:** The material supporting the analysis consists of research carried out within the Norwegian construction industry over the last decade. The material includes scientific articles, white papers, law-texts and regulatory material. The analysis follows a hermeneutical-analytic approach. **Findings:** The analysis is organised according to the categories temporality, compartmentalisation, compliancy, technics vs. process and climate adaptation. Within all the categories analysed, problems are identified that surpass the scope of quick-fix measures. It seems to be a genuine lack of responsiveness in the Norwegian industry today concerning altering framework and social conditions. Taken together, there seems to be a need for a fundamental rethinking of the formal organisation of the industry taken as a whole. **Implications:** Several concrete measures are proposed for addressing the challenges identified. Among these are the temporal integration of technical regulations with contract formats and horizons of analysis, increased accountability of top-management for compliancy, an increased research effort on the integrating technical with processual challenges, and increased formal integration concerning altering physical framework conditions.

**Keywords:** Temporality, Construction industry, Compliancy, Climate adaptation

### **3.3. The Urban FM role – Experiences from an urban development project in Gjøvik, a medium Norwegian City**

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FM services can be more than in-house services that adds value to a core business. The idea of the Urban FM concept is that it gives services of the neighbourhood with the aim to build competitive and healthy surroundings with high quality for residence, business and spare time. Shared-values and value creation increases the need for more innovative business models that are in need of shared spaces and public rooms that invites people to join and participate in activities that increases their well-being as well as their businesses. How to integrate the social aspect of sustainability in urban development is not well understood and still needs further research. Gjøvik municipality are planning to develop a new urban area close to the water front side of the city. They invited different stakeholders among private residential, businesses, researchers and expertise to participate in this project. We use this project as an research lab for developing new business models for ideas and shared values of sustainability issues and to look at future needs for common services in the urban environment under the concept of Urban FM. This paper shares the experiences from the project and discuss the Urban FM role in the future. We discuss also the business model developed in this project and look at how this can be further explored in development of innovative urban areas in the future.

**Keywords:** Urban FM, Business models, Shared value creation, Innovation, Urban areas

### 3.4. Decarbonisation of existing building stock in Slovenia – renovation opportunities and gaps

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In 2015 Slovenia adopted two main strategic documents - one in the field of nearly zero energy buildings (nZEB) and the other in the field of energy renovation of existing buildings. The Action plan for nearly zero energy buildings (AN sNES) gives the national technical definition of nZEB, the necessary steps for promotion of early nZEBs mostly in new buildings, but also in renovation: apart from high energy efficiency and low (primary) energy also min. 50% share of renewables is required in nZEB building energy performance. The adopted commitments in national strategies and plans are essential for accomplishment of the targets of EU climate and energy policy. Slovenia has accepted Long term strategy for (energy) renovation of existing buildings (DSEPS), and hence by the year 2030 almost 26 million m<sup>2</sup> of building floor area, i.e 1,3 – 1,7 million m<sup>2</sup> annually, has to be substantially renovated, one third of that in nearly zero energy building standard. 75% of the envisaged renovation in DSEPS shall be done in residential buildings. Consequently, the following impacts were estimated: 15% (30%) reduction of final energy in building sector by 2020 (2030) with ref. to 2005; meeting 66% share of renewable energy in final energy in buildings by 2030 and reduction of GHG by 60% (70%) in building sector by the year 2020 (2030) with ref. to 2005. Slovenia aims at low-carbon society by 2050 where buildings and households are committed to reach ambitious target of zero-carbon energy use by 2050. The paper will evaluate the renovation opportunities and possible gaps in meeting decarbonisation targets in building sector. The data base of on energy performance certificates (EPC) (Directive 2010/31/EU (EPBD)) will be used. EPCs give the information on building energy performance and list recommendations to increase the building's energy efficiency by the implementation of cost effective and technically feasible renovation measures. In the period of 2013-2017, in Slovenia over 50.000 EPCs were issued (77% of them for residential buildings) and linked to the national real-estate registry. The analysis of the recommended renovation measures will focus on (a) the identified potential to increase buildings' energy efficiency and (b) the identified potential to replace fossil fuels with renewables. A special focus will be put on the evaluation of opportunities to increase the share of renewables (RES locally available, RES in local energy networks, decentralized production of energy from RES, smart energy solutions for districts). Investments in RES are subject to a complex set of national and local/regional climate and energy policies (i.e. local energy plans). The feasibility of the aim that 1/3 of renovated buildings shall meet nZEB criteria (for renovated building) will be examined and the progress towards decarbonisation of the building stock will be discussed.

**Keywords:** Deep renovation, Nearly zero energy building, Renewable energy, Energy performance certificate, Recommended measures, Building stock, Energy savings, gap, Climate and energy policy



## 4. Demographic Transition and Built Environment

#### **4.1. The study of factors that influence the apartment prices in the region of city center, Dardania, Ulpiana and Mati in the city of Prishtina**

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The purpose of this study is to identify the key factors that influence the apartment prices in three regions of Prishtina, which are: city center, Dardania, Ulpiana, and Mati. The study is important for the community of real estate appraisers since they will benefit from this study by knowing exactly the level of impact of key factors identified on apartment prices in the three regions of Prishtina. The present study raises the main research question: Which are the main factors that influence the apartment prices in the region of city center, Dardania and Mati in the city of Prishtina? The methodology of study is quantitative. The independent variables selected in the present study are: location, size of apartment, the floor, and year of construction. The research instrument are the real estate transactions that occurred in these areas in the period of 2017-2018 confirmed by notary services in Prishtina. The source of real estate transactions is the Ministry of Finance of Republic of Kosovo, Department of Property Taxes. The objects of study are 20 contracts in each region of the study subject to multiple regression analysis in SPSS to quantify the level of impact of the independent variables on the apartment prices in the selected regions of Prishtina in the period 2017-2018. In the city center and Mati 1 the location has the greatest impact followed by the year of construction, floor, and lastly the size. In Ulpiana region and Dardania, the multiple regression shows that the floor has the greatest impact, followed by location, year of construction and size.

**Keywords:** Location, Floor, Year of construction, Size, Apartment prices, Prishtina

#### 4.2. The Impact of Municipal Taxation and Revenues on the Bid Rent Curve Determined through Parameters of the Net Internal Migration

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Slovenia has no institutionalized intermediate level of government between the state and municipalities, therefore it is useful approach to the bid rent curve analysis of the central places through the changes of parameters in a gravity model, where the municipalities are considered as the CBD and its zones around it. Namely, the municipalities represent basic cells for realizing regional development with certain development objectives at the state level, competing with the other municipalities in the state. The achievement of these objectives is strongly linked to the financing of municipalities, their economic power, taxation policy and stability of economic and social system. One of the main factors affecting changes in internal migration is real estate taxation. A successful fiscal policy leads regions and local communities along the path of balanced and environmentally friendly long-term growth or a stable decline, analysed through the bid rent curves. The paper discusses the impact of changes in the property taxation and municipal revenues on the bid rent curve and the real estate prices. Therefore, the indicators evaluated through the changes of parameters in a gravity model which are subject of the changed taxation policy gives a proper forecasting values of a urban land rent and a bid curve derivatives. The model derived here is based on the derivation of the normalised NE\_SIM model and proves of Janež, Bogataj and Drobne (2016), who had proved, that the inter-municipal migration of Slovenia is supposed to be influenced, among other factors, by the taxation policy and revenues of municipalities. Also we suggest the proper analysis of the changes of the bid rent curve, as it was previously derived by Bogataj, Tuljak-Suban and Drobne (2011), where fuzzy approach was also facilitated. We discuss the impact of changed municipal taxation policy on the bid rent curve according to the submitted but later annulled The Real Property Tax Act.

**Keywords:** Bid rent curve, Real estate tax, Municipal revenue, Market value of residential real estates, Spatial interaction model, Internal migration

## 5. Digitalization and Real Estate

### 5.1. Driving Forces Behind Real Estate Digitalization: an exploration

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Piazolo (2018) presented his research *The Driving Forces Behind Real Estate Digitalization* at the American Real Estate Society Congress in Florida. He presented his research results in four chapters: (1) data and digitalization, (2) digital business models and applications, (3) digital business models and driving forces and (4) hypotheses about developments in the real estate area. When we look at data and digitalization we see a couple of movements: (1) data are the new currency of our time, (2) artificial Intelligence is the new electricity (Andrew Ng Baidu), (3) digitalization is not the implementation of another software, (4) digitalization is the change of the business model, (5) key activities are data Generation, data interpretation, distribution of insights and (6) value creation chain moves from the real world into the virtual world. Based on an inventory (Piazolo, 2018) of business models on the basis of digital technologies and applications he comes to the next overview.

	<b>Business Model</b>	<b>Application</b>
1	Crowd Investment	Online investment products
2	Big Data / Smart Data	Data management, analysis, reports
3	BIM / Property Management	Efficient use and management
4	Online Brokerage	Digital broker
5	Online Market Place	Digital consolidation
6	Smart Building	Use of sensors and Internet of Things
7	Smart Services	Digital contracts and transaction management
8	3-D-Printer	Flexible production and layout

*Source: Business models on the basis of digital technologies and applications (Piazolo 2008)*

An example from application to driving force is the business model smart services and application digital contracts and transaction management: computer algorithms to represent contracts or to support execution of contracts. Additional written fixing of contracts becomes redundant and many types of contracts become self-executable. Benefits for smart contracts are higher safeness of contracts and reduction of transaction costs. The driving forces of smart services are new standards and new processes. Thereby Piazolo (2018) presented an overview of business models on the basis of digital technologies and driving force.

	<b>Business Model</b>	<b>Application</b>
1	Crowd Investment	New offer
2	Big Data / Smart Data	New contents and new insights
3	BIM / Property Management	Raising efficiency / Increasing transparency
4	Online Brokerage	Raising efficiency
5	Online Market Place	Increasing transparency
6	Smart Building	New offer
7	Smart Services	New standards and new processes
8	3-D-Printer	Enhancing flexibility

*Source: Business models on the basis of digital technologies and driving force (Piazolo 2018).*

As Piazolo states in his presented research results are the driving forces of digital technologies: (1) increasing transparency, (2) raising efficiency, (3) enhancing flexibility and (4) enabling new opportunities, new contents, and new insights. These four formative characteristic will also describe future new developments in real estate within a few years. Piazolo concluded that Companies that fulfill with their business models these characteristics will prevail against competition and otherwise crowding out through competition. He also mentions a couple of hypotheses for discussion for digitalization and real estate: (1) transparency-pressure will increase, (2) platforms will continue to gain importance, (3) frictionless execution of all secondary processes around bought product is expected, (4) quality and credibility are demanded, (5) power of control about data as important as staff and (6) processes automated, but staff is more flexible.

**Keywords:** Driving forces, Real estate, Digitalization, Business models

## 5.2. Added to digitalization group. Get a Brick and Blockchain

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Get a Brick is a start-up that wants to make property investments accessible for everyone by reducing the participation to a minimum. Through an online platform people can participate and can become partially owner of residential and commercial properties. The properties will be displayed on the platform with all the essential financial, market and investment details. If the people choose to invest in a property they will become a 'Brickstarter' and will receive information about the property through an app (Brickstarters, 2017). They will also have the ability to vote on certain decisions concerning the property like an investment in sustainability. Get a Brick is aiming to create a portfolio with innovative, unique and sustainable properties with investors who want to receive financial and social returns. The goal is to add quality, sustainability and innovation to the built environment for society by the people (Get a Brick, 2018). "The blockchain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value." (Tapscott, 2016). This system would create the opportunity for Get a Brick to reduce the costs that are linked to gathering high capital through many investors through a transparent and trustworthy manner (Tapscott, 2016). By using smart contracts, which can enforce the conditions that Get a Brick will set for participating in a property investment through cryptographic code, the transactions of ownership and money transfers can be automated (Bout, 2018). In an optimal situation the entire real estate management of the portfolio of Get a Brick can also be regulated by the Blockchain to increase the effectiveness and velocity of the processes and decrease the related costs. The effect of minimizing the operating and overhead costs of Get a Brick could result in continuous higher yields than the theoretical yields that are mentioned in benchmarks. Therefore, Blockchain could be a tool in realising an abnormal return which can be measured by the Jensen's Alpha.

**Keywords:** Property investments, Blockchain, Partially ownership, Accessibility, Returns

### 5.3. Digitalization of FM services in Norway – The beauty or the beast.

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Digitalization is the new buzzword among the construction sector as well as within the Facilities and Property Management business. This paper aims to investigate the use of digitalization within facility management (FM) services in Norway. We mapped attitudes towards the use of digital tools and systems to optimize the operation of buildings among building owners and Norwegian FM providers. We look at how digitalization of services can be beneficial as well as how that can be a hinder towards efficient services. We base this Research on a literature review, short survey and semi structured interviews among FM providers and owners. The findings state that digitalization within FM services is in a starting phase. The literature underpins that the application and availability of FM products expect to develop and increase. The current situation among building owners and FM providers are characterized as: a tendency to digitize individually, not having a holistic approach to digitization, the FM provider and the owner lack competence about possibilities and application regarding new technology, as well as the interaction between owner and the FM provider is an absolutely demand in order to create efficient services. If there is a building information model that is not adapted to the operational need, the handover phase from construction to operation is also a challenge. In our study, we identify the following barriers towards digitalization: choice of procurement methods, lack of standardization, the scope of Service Level Agreements (SLAs), interpersonal barriers and circumstances around ownership of the buildings. In this paper we discuss three approaches as possible solutions: (1) Increased focus on early involvement of the FM provider, (2) interactive training of new digital applications and (3) dialogues to increase competence and to try new possibilities to reach sustainable goals in the operation of properties. This research gives important input to increase the understanding of what hinders building owners and FM providers to reach sustainability goals. Digital FM services can be better suited towards owner's needs, and provide useful data of the utilization of space and the provided FM services.

**Keywords:** Digitalization, Building owners role, Facility management providers, Interactive training



#### 5.4. Technological integration of the “house of the future”

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For many years, numerous innovative housing projects have introduced visions on the future of everyday life by foreseeing the success of various smart technologies at home. In general, these projects are thought to be “futuristic, industrial, expensive and gadgetry” (Mohammadi, 2010). On the other hand, most of the experimental home technologies at that time are already infiltrated into today’s daily activities. Therefore, the motivation of this paper is to explore the different variables that affect the integration level of innovative technologies in the past. Purpose: This study aims to provide an overview of the impact of smart technologies at home environment on architectural design in relation to the promises of the innovative housing projects entitled as “house of the future”. The adaptation of the technological innovations in the housing projects is analyzed by mapping the existing cases. Design/methodology/approach: Based on literature, the study is limited to fifty (50) innovative housing projects, in the period from 1920 to 2010. In the scope of the work, only one of the similar projects designed by the same initiator is included, and the conceptual projects in terms of not specifying the promising technology and their impacts are eliminated. The selected cases are examined with their “date”, “place”, “typology”, “goal”, and “technological novelty at that time”. Thus the rate of vitality and necessity of the technological innovations in architectural design are reconsidered and discussed regarding the impact of those features on nowadays architecture. Findings/Results: This paper provides a table of case studies which shows the connections between typology, goal, date, and place of the building and the influence of promising technology at that time to become vital and necessary of today. The table indicates five typologies: concepts (ideas transferred to paper), prototypes (built concept), showcases (open exhibition for visitors), experimental lab (monitoring use/adjusted frequently), and inhabited dwelling (taken into production and used). The analysis presents a relation between the decade and the typology of the case, and helps to trace the impact of innovative smart technologies compared with the goal of the projects. Originality/value: The novelty of this study is to synthesize the history of the innovative housing projects through their contribution to the adaptation of smart technologies in architectural design. The added value lies in the insights of the features of the cases how they affect the integration of technology into daily life.

**Keywords:** Historical Overview – House of the Future - Innovative housing - Case studies - Smart technology

## 6. Energy & Learning

## 6.1. New Evidence in Contemporary Decision-making in Spatial planning

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The article deals with contemporary trends in evidence-based decision-making in spatial planning procedures, whereby new knowledge is required to meet challenges, as adopted by political bodies on the highest global level. Stemming from the principles of contemporary spatial development, as stated in the Habitat III document, adopted in Quito in 2017, the article will discuss some of the issues, which go beyond the commonly discussed topics of spatial development planning. Certain parallels, drawn from historical city development and principles, such as the Indus valley civilisation and the writings of Vitruvius, will be presented. The first new theme is Resilience, investigated from the aspect of individual and collective categories and goes beyond the common understanding of safety and security as public interest. The second new theme is Social justice, discussing access to common goods, such as clean drinking water, clean air and waste management, as well as inclusion in decision-making processes that concern property and rights. The third new theme is energy efficiency, understood from the broader scale of urban quality, as well as on the detailed scale of particular buildings. In conclusion, the article argues for different decision-making principles, which should be knowledge-based rather than sporadic and initiative-based, implying accountability and responsibility of the decision-maker, but also a significant contribution to alleviating risks and providing higher security for investment planning.

**Keywords:** Energy efficiency, Habitat III, Planning procedure, Resilience, Social justice

## 6.2. Built environment in school buildings in Prishtina and its correlation with student achievements in PISA testing in 2016: Case study school buildings in Prishtina

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Authors brief professional biography: all the authors of this paper have acquired academic degrees in ESLG college in Prishtina (Kosovo) with the main focus in real Estate and Infrastructure Management. One semester of the second year of our Master studies we have finished in NTNU (Trondheim, Norway) and we have graduated under mentorship of our distinguished professors from NTNU. After graduation we were given the chance to serve in ESLG as teaching assistants and as such we were able to work together by assisting and mentoring our students on many research projects related to real estate management. The first time Kosovo's participation to an international education valuation, the Programme for Educational Student Assessment (PISA), resulted with low ranking, confirming this way that the 15 year old students tested, didn't demonstrate and achieved the basic skills needed to be acquired by this age. On the other hand Kosovo's education facilities have been improved since 1999 with the help of international organisations, but there's still the lack of space and problems with sanitary facilities. With these problems representing the educational situation in nowadays Kosovo, the purpose of this study is to analyse the built environment of the schools, in terms of visual and thermal comfort. By analysing the physical environment of school buildings, this study will attempt to find out whether there is a correlation between built environment and student achievements. The study will be based on the observation survey conducted at the sites based on international standard for Condition Survey NS 3424 and FM standard for categorisation of buildings NS 15221:4, which will result with categorisation of present elements of the buildings. The elements to be analyzed are the ones that have impact on teaching-learning comfort such as: windows, lighting, HVAC systems. The findings of the study will serve as basis for future improvements of the built environment and eventually development of Regulatory Data Bank that will serve to various stakeholders of education system in Kosovo. At the same time results of this research will serve as benchmark for comparison of similar situations in future, starting from this year since PISA test takes place every second year and it will be interesting to compare the results of 2016 and 2018 and see if our Problem Statement stands as true or not.

**Keywords:** Built environment, School buildings, Education, Student achievement

### **6.3. A study on optimum insulation thicknesses and payback periods for the use of a building during heating and cooling seasons**

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The number of studies on energy saving and energy efficiency issues is increasing day by day. This is due to the fact that the energy requirement increases in every field with developing technology. At the same time, increased foreign currency rates have led people to use less energy in Turkey, which imports the major part of the energy requirements from abroad. In this study, it is focused on external wall insulation, which is one of the most common applications in building sector for the energy conservation. The effect of different wall insulation thickness on energy cost and total cost was observed considering the solar radiation for a building located in Sanliurfa province. Firstly, daily average outdoor temperatures were obtained for the studied province. Then, solar-air temperature, heating degree-day (HDD) and cooling degree-day (CDD) values were calculated by taking into account the solar radiation values per unit surface. The heat transfer rates in walls, which have different insulation thicknesses were obtained for both heating and cooling seasons. In addition, cost calculations were made in the study and optimum insulation thicknesses were presented for heating/cooling seasons separately. Lastly, payback periods and saving amounts were calculated for the optimum insulation thicknesses regarding the life of the system, interest rate and inflation rate.

**Keywords:** Energy conservation, Solar radiation, Insulation, Degree-day

#### 6.4. Heritage buildings and energy renovation – the Slovenian perspective

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Energy renovation of buildings is one of the activities at the forefront of international sustainability and climate change mitigation policies and strategies. The feasibility of actual release of technical potential for energy efficiency upgrade embedded in the existing building stock, however, depends on many factors and boundary conditions. Buildings registered as cultural heritage and as such specifically protected against tangible threats to their historic and cultural integrity are probably the major general case where implementation of even technically and economically most sensible measures for improvement of their energy indicators is not self-evident; not unless in compliance with conditions defined by institutions for protection of cultural heritage. Recent strategical documents and financing mechanisms focusing on energy renovation of buildings in Slovenia have addressed also the heritage building stock. This brought forward the need for a closer cooperation of different professions to engage in an interdisciplinary approach towards planning and implementation of energy efficiency interventions. Among other, publication of national guidelines for energy renovation of cultural heritage buildings (2017) constitutes an important step in this direction. Through semi-structured interviews with selected stakeholders from regional offices and departments of the Institute for the Protection of Cultural Heritage of Slovenia their opinions and statements were collected and analysed, aiming attention among other at their attitude towards general importance of energy indicators of heritage buildings, acceptability of various standard and advanced renovation products and technologies, the level of acquaintance with national rules and guidelines for energy renovation of cultural heritage buildings, a prospective need for an upgrade and interlinking of databases and registers to enable better advance assessment of potentials and planning of measures, and possible noticeable changes in trends when defining admissible interventions from the energy efficiency point of view. It is evident that there are open opportunities for an upgrade and exchange of knowledge among relevant professions engaged in processes of protection and renovation of heritage buildings. The energy aspect of heritage buildings is gaining recognition also in connection with thermal comfort and operational and maintenance costs, but this does not imply abandoning of primary principles of cultural heritage protection. One of the important gaps to be closed relates to the scope of information contained in national registers, and their interoperability.

**Keywords:** Heritage buildings, Energy efficiency, Renovation, Guidelines, Policy

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## 6.5. Don't be afraid, embrace complexity! - A systems approach for the design and evaluation of Higher Education learning environments

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Higher Education institutions (HEIs) have undergone fundamental changes driven by ICT developments, globalization, and the advent of socio-constructivist pedagogic approaches. As a result, within the UK, capital investment in new facilities and retrofit of existing spaces has reached a record expenditure of 3 billion pounds in 2016. Although, general space and investment efficiency indicators exist, these still fail to assess the impact on end-users or how buildings enable the purposes for which they are developed. The literature review, highlights the limitations and findings from recent research on user-centric evaluations of facilities, and particularly those in Learning Spaces in HEIs. Existing evaluations have been dominated by reductionist approaches focused on measuring outcomes on the users, such as satisfaction, learning outcomes or engagement. This approach has a major pitfall, it neglects the complexity of the dynamic relationships between people, spaces, technology, institutional structure and pedagogic practices. In response, the paper aims to propose a shift on current evaluation and analysis approaches by exploring the use of Human Factors/Ergonomics (HFE), an academic discipline with a focus on systems design in its core. Among the various methodologies that exist within HFE offer promising alternatives to inform the design and management of Higher Education Learning Environments. A specific tool is Cognitive Work Analysis that through its formative view of systems design, and its aim being the understanding and modelling the constraints influencing the possible behaviors of its users, offer promising supplementary holistic framework to inform interventions, such as the retrofit of spaces, or the implementation of new technologies or pedagogic practices. In conclusion, a systems approach offers a complement to existing reductionist measures and dominant approaches to evaluation, while, Human Factors offers theoretically sound and proven tools, such as CWA, to re-design spaces in relation to the environment, the activities, and user's preferences and cognitive capabilities. The current paper's aim is exploratory and conceptual in nature and scene setting for future research into the application of the proposed methodologies for Higher Education space design and evaluation.

**Keywords:** Post-Occupancy evaluation, Learning space evaluations, Higher-education facilities, Human factors/ergonomics, Sociotechnical systems, Cognitive work analysis

## 6.6. The cost effect of sustainable climate installations

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Reducing user costs is an important factor for tenants of commercial real estate in choosing sustainable objects. Various studies in the commercial real estate sector indeed emphasize costs effects by structural energy savings. However, for a transparent conclusion on the cost effects of sustainable real estate a broader point of view is necessary. Dutch tenants for example are responsible for paying the maintenance costs of climate installations as well. Understanding these broader cost saving effects improves insights into the real benefits of sustainable investments in general. In this paper we examine the maintenance cost of climate installations in commercial real estate in relation to the energy label. We do so by using a database of the climate installations and maintenance costs of Dutch commercial real estate assets. Our findings show that the maintenance costs of sustainable climate installations of commercial real estate in the Netherlands are negative correlated with the energy label. Moreover: the less sustainable the energy label, the lower the maintenance costs of climate installations are. Between a B label and the lowest G label there is a difference of € 1.300,- for maintenance per year. These findings undermine the illusion of the cost benefits for tenants of commercial real estate in the Netherlands.

**Keywords:** Sustainability, Commercial, Real estate, Climate installations



## 6.7. Buildings' Energy Consumption Forecasting - a Model based on General Regression Neural Network

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The energy consumption of buildings has an impact on the environment, and also influences the economic and social needs of the buildings' users. Thus, energy consumption forecasting is important, particularly during the optimal building design selection. That is a complex and responsible process which depends on numerous and time-changeable factors. Thus, it is helpful to have a model for buildings' energy consumption forecasting. This paper presents such a model using historical data for real energy consumption of 55 buildings built in R. Macedonia. Data were used as an input in DTREG software. The model was built by application of General regression neural network. The prediction of the target variable – building' energy consumption was very accurate, considering that the data are real (the model' mean absolute percentage error – MAPE is 3.12 %, and the coefficient R<sup>2</sup> which gives the global fit of the model, i.e. the coefficient of determination, is 91.70%). The coefficient of correlation between actual and predicted target values is 0.969. The general conclusion is that forecasting models for energy consumption of the buildings are a useful tool for all project participants and should be used as a support in the process of building' design selection.

**Keywords:** Building, Energy usage, Forecasting, General regression neural network

## 6.8. Geothermal Energy Integration in Urban Systems: Case Study of Armutlu District

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The urban energy systems significantly affects the health, happiness and well-being of inhabitants. Renewable energy sources such as geothermal energy can be used in numerous applications in urban systems and adds value to the cities. Due to its geographical and geological location, Turkey is one of the most abundant countries in the world, in terms of geothermal potential. Armutlu is a touristic town which has been declared as a thermal culture and tourism protection and development zone by the Culture and Tourism Ministry of Turkey. Since then, the installed capacity of the drilled wells in the region has been increased 8 times. Currently, geothermal energy has been using for various applications in the district, including space heating, greenhouse heating, agricultural drying, bathing and swimming. This article highlights that renewable energy integration into urban environment can make a significant contribution to minimizing environmental pollution and enhancing human health and comfort. It is shown that geothermal energy provides numerous benefits to the cities from an economic, environmental and energetic point of view.

**Keywords:** Geothermal energy, District heating, Greenhouse heating, Drying system

## 7. Healthy Ageing

## 7.1. Set of criteria for older adults with early stage dementia to enable them to live longer in their own homes

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**Purpose and problem statement** – The purpose of this research article is to give an overview of the symptoms of dementia and set up criteria for designing smart solutions that enable older adults with early-stage dementia (further referred to as older adults) to live longer in their own homes. The aging population and a decline in the working force affect the Dutch healthcare system (Van Rijn, 2013). Policies are shifting from inpatient to outpatient care. Enabling older adults to live longer in their own homes (aging in place) can have a positive effect on their quality of life. Smart living environments which stimulate and support older can encourage aging in place (Morris et al., 2013). Before these smart living environments can be further developed, an overview should be constructed with the wishes and needs of these older adults. Much has been written about architectural solutions that should improve the living environment for older adults with dementia (van Hoof, 2010; Nillesen & Opitz, 2013). Less attention has been paid to the actual needs of the older adults concerning smart living solutions (Mohammadi, 2014). Nowadays, all older adults with dementia that live in an inpatient institution use a form of smart technology (Mohammadi, 2014). However, these products are installed and not embedded into the architectural design. To develop smart living environments that really adapt to the actual needs of the older adults, the different symptoms and stages of dementia, and how they influence daily life should be examined. **Method** – We propose to perform a literature review on the symptoms of dementia, in order to get a better understanding of older adults. Based on two validated diagnostic tools namely; The Global Deterioration Scale (GDS) (Reisberg, Ferris, de Leon, & Crook, 1982) and the Clinical Dementia Rating Scale (CDR) (Hughes, Berg, Danziger, Coben, & Martin, 1982; Morris, 1993), an overview of the symptoms of dementia can be given. The literature framework does not aim to be a new diagnostic test or a symptom check-list, but it will be a new tool for designers to get a clear overview of the symptoms of dementia. **Results and conclusions** – The constructed literature framework provides more insights in the actual needs of older adults which will enable designers to set up requirements and focus areas for further development of more specialized smart living concepts that optimally anticipate and adapt to the behavior of older adults and can stimulate mental, social and physical health.

**Keywords:** Smart living environment, Symptoms dementia, Early stage dementia, Set of design criteria

## 7.2. Living of the elderly in the owner-occupied housing in Slovenia

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In Slovenia, the ownership structure of apartments and housing units is predominant. More than 80% of occupied dwellings are owner-occupied (Statistical Office of the Republic of Slovenia, 2015). This is because of two processes. First, until independence in 1991 so-called “self-built” was the most widespread form of building individual houses. Second, after independence, a radical privatisation of the state-owned rental housing stock was carried out. In the period of rapid population ageing it turned out that owner-occupied housing stock is not suitable for the changing needs of the elderly. This article therefore presents housing conditions in the own-occupied dwellings from the perspective of old peoples’ living. In case of self-built residential houses, for example, houses are of a very big size built in two or three floors with staircases which are unheated and poorly illuminated, entrances are in the high ground floor and accessible only by stairs, rooms are often small and floor plans do not allow the change of different use of rooms and organization of life, the corridors are narrow, absence of a bathroom in the main living area and inappropriate bathroom furnishings (e.g., bathtubs instead of showers, absence of grab bars) etc. Due to a poor supply of building materials and equipment cheap materials in equipment were installed. Often the basic plan of houses was adjusted by self-builders, but many of the solutions that self-builders understood as good and which served well at that time to some extent turned out to be unsuitable in the period of old age. In multi-dwelling buildings, the construction was focused at rapid and inexpensive creating of a larger number of dwellings in concentrated neighbourhoods due to the chronic shortage of housing after second World War. Namely, same as other socialist countries also state-owned enterprises started to build apartment blocks for the workers, predominantly agricultural population that migrate to cities where it was easier to find a source of income. Residential plans of multi-dwelling buildings and apartments in them were predicted for healthy, young people, families with children. But same as in the case of self-built residential houses also for this construction which was spatially minimalistic, rational, cheap, prefabricated turned out to have many architectural obstacles in the old age, such as stairs, thresholds, slippery floors, heavy doors, halls that are too narrow etc. Beside architectural obstacles article presents other negative sides of the elderlies’ living in the owner-occupied housing in Slovenia, such as maintenance costs, and suggests some solutions.

**Keywords:** Housing, Population ageing, Living, Architectural obstacles

### **7.3. Mitigating age related risks in Smart Silver Retirement Villages, creating social value in the context of Health Care and Long-Term Care provision**

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EU Member states are ageing. The share of the older adults 65+ will double and 80+ will triple in next half of century, according to the Ageing report 2018. This demographic development is driving the costs of health care (HC) and long-term care (LTC) provision. This population dynamics is driving rising public expenditures for HC and LTC, without visible improvement in quality of life for older adults. Many EU Member states have not yet developed the new LTC legislation to cope this pressing challenge. They are discussing about sustainable models of the community based LTC which would mitigate the rise of expenditures and increase the quality of life of older adults, especially those, dependent on the help of others. After reviewing several policy reports and the highly ranked journals with the academic papers related to the social value of retirement facilities, using a variety of key word searchers in WOS and SCOPUS, as well as different sources of housing policy papers, we realized strong evidence base on the relationship between housing, health care and the long-term care costs. There is much data on the relationship between poor housing and increases of health problems like increase in falls, excess winter deaths because of poor heating and accessibility, cardiovascular diseases, and reduced mental health of those, living in poor housing units. Older people are more exposed to these risks. But the complementary body of literature we can find evidences on the benefits of adapted housing units to older people, where the benefits can be quantified. These potential benefits could be monetized in terms of cost savings to the national health and LTC insurance as well as obligatory transfers to residential care housing units. Based on the literature review and multiple decrement skeleton in the paper, we present how the construction and management of smart silver retirement villages is creating social value in the context of Health Care and Long-Term Care provision, reducing falls, frequency of visiting the doctors and assistance requirements, as well as decreasing the dynamics of dementia development. The rent in such a retirement village is much lower than potential savings of HC and LTC. The conclusions are giving the directives to the public authorities and HC insurance institutes how to consider and evaluate the programs of subsidizing the rent for seniors' housing in the retirement villages, which will also decrease the total costs of HC and LTC.

**Keywords:** Risk management, Retirement villages, Health care, Long term care, Population ageing, Multiple decrement model

#### **7.4. Elderly and the impact of the maintenance cost of their real estate on their potential relocation**

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The article focuses on the question how the maintenance cost of real estate owned by the elderly impact on their satisfaction, quality of living and potential relocation into a suitable accommodation unit. In Slovenia more than 80% of households owned their home and among these more than 60% of owners are over 65 years old. The main instrument for measuring the participants' expectations is a questionnaire in which 471 participants older than 65 years took part. We statistically analysed the results by conducting one-way analysis of variance regarding the participants' different demographic and socio-economic characteristic. By analysing the results of statistical analyses it is evident that Slovene participants according to the maintenance cost expressed statistically significant differences regarding most of their demographic and socio-economic characteristic. The main conclusion is that the participants would not sell their property in any way, nor in return for a better quality living environment. The attachment to the environment where they live is extremely high. They prefer to solve the problems of maintaining rather than moving to a more suitable home or environment. We explain this with a strong social affiliation to the micro environment, strong intergenerational attachment and the reluctance of migration among Slovenians.

**Keywords:** Elderly, maintenance cost, Real estate, Demographic and socio-economic characteristic, Slovenia

## 7.5. The social infrastructure from the perspective of social work with older people

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The specific nature of social work lies in transversal understanding of older people, their needs, and in the assertion of the user as a partner in the helping process. From social work perspective we define social infrastructure on three levels: the micro level, implying social infrastructure within the family and social networks, the meso level of a community, and the macro level of society as a whole. Social work operates on all these levels, exploiting its particular knowledge about social networks. It is possible to argue that social workers most frequently fulfil their mission through social care services, through which they co-create solutions with individuals, families and social groups, within a community and in relation to the state. On the micro level, social work is concerned with how to establish and strengthen solidarity between generations within the family, where resources needed to resolve deficient interpersonal solidarity on other levels are located. This level is composed of various aspects of relations among parents and children, including emotional ties, exchange of various services and activities, as well as conflicts, discords and ambivalences. The manner in which the family will respond to the challenge depends on the living pattern of individual family and its reaction to changes which the old age inevitably brings about. Our lives are necessarily connected with the community. On the meso level, social work with older people seeks to find ways in which social networks may be strengthened, to establish how organisations within the community can contribute to it and how the community can be mobilised. Using the knowledge about the needs of older people, social workers contribute to the development and linking of various services. There are three formal sectors providing help for older people: (1) the public sector with its social work centres, homes for older people, centres for assistance at home, and providers of other public services and forms of living, for example, sheltered housing; (2) the private sector, and (3) NGOs and volunteer organisations working with, for example, the retired people's associations, self-help groups etc. The critical studies are searching the negative elements of institutional protection that affect the quality of older people's lives. Social work should not overlook these findings, but should try to find solutions to eliminate difficulties. Therefore the deinstitutionalisation and development of community care are at the core of social work in the last decades. The macro level involves cohesion within society as a whole. It necessitates the linking of measures taken on the national level with activities undertaken on the other two levels, and at the same time it creates an autonomous and legitimate space for the state enabling it to adopt the kind of policy that will encourage social infrastructure. The task of social workers is to contribute to the transformation of policies and the resulting attitudes towards older people on the local and national levels).

**Keywords:** Social networks, Deinstitutionalisation, Community care, Family, Inter-generational solidarity, Social work



## 8. Managing Real Estate

### 8.1. Brexit impact on the real estate sector

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Problem statement: The outcome of the UK's referendum on European union and looming exit negotiations, are affecting both the economy and the real estate sector. Companies will consider reallocation to mainland Europe and north to Dublin, Ireland. In my article I will focus on real estate sector in London, will Brexit affect it or not. In two different studies prediction are opposing each other. One is suggesting real drop of prices and other is predicting the even outcome, due to continuous immigration and development. How will mainland profit and will there be a rise of demand in particular cities like Frankfurt, Berlin, Munich, Hamburg and non-German Dublin, Paris, Reykjavik etc. Which are already fast gaining the interest of investors, leading to a significant rise in the volume of transactions. This will have an impact on demand for space, especially in established locations. Frankfurt am Main will play a main role in vying for companies, as it has a competitive infrastructure and demonstrated that important financial institutions are willing to establish presence there. The property market has been hurt by slower economic growth and a squeeze on consumers' incomes since the referendum to leave the European Union in 2016. The Royal Institution of Chartered Surveyors said last month that activity remains subdued, and mortgage approvals fell to a three-year low last month. The acceleration in annual house price growth is a little surprising and the lack of supply is likely to be the key factor providing support to house prices said Robert Gardner, chief economist at Nationwide, on a results that show rising in London, UK's real estate sector at the start of 2018. Rising vacancy rates, falling rents and a decline in investment spending could be possible consequences for the property market in London, if the UK leaves the EU. Market participants have stated that at least the prime segment in London is not expected to continue to grow. In response to the referendum outcome, the Norwegian sovereign fund has adjusted down the estimated value of its UK real estate holdings by 5%. According to the quarterly report of the sovereign fund, the vote to leave the EU has triggered significant movements in financial markets and considerable uncertainty. This will have a negative impact on property values. In the short term, and in case of most properties, no negative change of profitability is expected. Since predictions and results don't match up, further screening of the real estate market movements are essential to broaden the big picture on a subject matter.

**Keywords:** Brexit, United Kingdom, European Union, Consequence, Law, Real estate, Prices, Housing market, Economy

## **8.2. The uptake and implementation of performance measurement in oil and gas pipeline maintenance project**

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**Purpose-** This study investigates the use of performance measures and how performance measurement impacts pipeline maintenance project in the oil and gas industry. **Design/methodology/approach-** The authors conducted an exploratory multiple case studies using three oil and gas companies in Nigeria. Field data were collected using grounded theory approach that encompassed qualitative interviews, observation and focus group focusing on the uptake and implementation, usage practices, and their performance effects. **Findings-**The study finds that the involvement of major stakeholders as well as top management commitment is essential for the successful uptake and implementation performance measurement system. The process of implementation of the strategic performance measures differs amongst companies because of its intangible benefits to the organisation. Hence, emphasis should be put into handling top management and other key relevant stakeholders within the organisation. **Practical implications-** Pipeline integrity management staff and strategy developers may benefit from this study in refining, advancing and enrooting their own plans. The process of applying feasible measures is well explained in a systematic manner to guide the responsible person throughout the whole strategic maintenance process. **Originality/value-** This paper outlined the significance of performance measurement usage and how they affect performance by incorporating performance measurement and pipeline integrity management system, an innovative means of improving pipeline maintenance project in the O&G industry.

**Keywords:** Performance measurement, Integrity management, Maintenance management, Top management commitment and support, Exploratory case study and field data

### 8.3. Alternatives for Municipal Real Estate Management

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Many authors highlight the increasing interest in the field of Municipal Real Estate Management (MREM) caused by the lack of profound research, as opposed to Corporate Real Estate Management (CREM) which has been extensively researched. Municipalities increasingly desire an effective and efficient utilisation of their real estate department in order to manage their real estate portfolio. However, as literature highlights, current practice has numerous problems which can be elaborated as: lack of insight in their real estate portfolio, steering ability, defined processes and competency levels. Moreover, authors state that urgency for change appears to be missing. This is perhaps caused by the limited transparency of total costs and lack of benchmarking, in particular relative to the market. The study of Veuger & Aalbers (2013) revealed an indication that the market is more efficient at managing their portfolio. This study will be enriched by exploring which of the 11 CREM asset management tasks are executed, both in market and municipal settings. The purpose of this study is to explore how CREM could contribute to professionalizing MREM by seeking alternatives. The alternatives can be found in outsourcing solutions or alternative ownership structure. These are described in relation to the market for Municipal Real Estate Management. The current state of affairs (both market and municipality) will be identified. For a valid comparison, municipalities will be compared to the market based on a single object; the municipal's housing accommodation (compared with offices for market parties). Using semi-structured interviews of several large municipalities in the Netherlands, the director/head of the organisation, financial controller and asset manager of the municipal office estate will be interviewed. The director will be questioned on the current execution of activities, the organisational structure, FTE composition and systematic processes. The financial controller will be used to acquire global data for a brief financial comparison and the asset manager on their responsibility for the management of the estate. The asset manager will also be questioned on his/her daily activities and political quests. Additionally, the asset manager will be asked which of the 11 given CREM tasks are executed and information will be acquired on the (non)execution and reasons as to why. It is expected that heterogeneity will be found where the market operates more cost effectively. Such positive cost effective differences can be found in: better defined processes, higher competency levels, task ownership and competition. This research aims to identify the driving factors behind such (in)differences. Using the results from the current state of affairs, a literature study is conducted to create an inventory on possible alternatives for collaboration with the market; through outsourcing or ownership structures. In addition, each alternative's pro's, con's, pitfalls and conditions for success will be listed. Moreover, each alternative will be tested using three economic theories: Resource Based View (RBV), Agency Theory and Transaction Cost Theory. Using an expert-panel the alternatives will be discussed and the most optimal form will be chosen. Based on political vulnerability it is expected that only a few alternatives have a reasonable chance of success. The expected optimal outcome is a public private joint venture.

**Keywords:** MREM, CREM, Outsourcing, Ownership structures, Efficiency

#### 8.4. The impact of National Facility Management Associations on the business

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**Problem Statement:** How much can establishment of a national Facility Management (FM) association affect the business in a country, in the context of maturity, service quality and economy? **Purpose of the study:** The purpose of the study is to get a better overview of the development of FM business in the countries within some ex-Yugoslavian countries, such as Croatia, Serbia and Macedonia, which are less mature in FM and lack national FM associations. The study aims to discuss the possible influence of the association on the business in those countries. **Methods:** The research will explore the reasons behind the current levels of maturity in a qualitative manner and analyse the positive effects of establishing a national association. **Findings and results:** The study is based on the collected data from qualitative semi-structured interviews with key representatives from FM sector within the countries; Croatia, Serbia and Macedonia. **Conclusion and recommendation:** There are varying degrees of FM maturity on global level, while it's a pertinent topic and increasingly being standardized and globalised through international standards, some countries are not keeping up with the global development. This might be achieved through FM associations.

**Keywords:** Facilities Management, Associations, Maturity, Croatia, Serbia, Macedonia

## 8.5. The meaning of information governance for sustainable maintenance management

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Asset and facility management are increasingly becoming data intensive. Data driven approaches are entering the practice of many professionals in the built environment and provide opportunities for developing sustainable maintenance strategies. These data driven approaches rely on the reuse of data which are produced stored and modified in network organizations when maintenance activities are outsourced to maintenance contractors, Original Equipment Manufacturers (OEM's) or specialised companies. The governance of data in those networked facility management environments seems to be an under researched area. This discussion paper aims to explore the meaning of information governance for asset and facilities management. This research topic is explored from a theoretical perspective using a 'governance' lens. Governance has different meanings in various academic traditions. The governance perspective therefore is explored by structuring and reviewing these different academic traditions. Based on a discussion on the fundamental elements of governance, we will argue that designing information governance can be framed as a process of identifying certain decision areas and the subsequent allocation of accountabilities and responsibilities for those decision areas to stakeholders in a network. As part of our review on governance, we used property rights literature to analyse in what way building ownership can influence these allocations of accountabilities and responsibilities. Finally, a preliminary framework is presented for the design of information governance for sustainable maintenance management. This preliminary framework with a-priori constructs and relations will be used for theory building using case studies.

**Keywords:** Asset management; Facilities management; Sustainable maintenance; Information governance

## 8.6. Heritage Buildings and Buildings in City Center as a Systems

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Background of real estate value of culture heritage buildings (HB) or buildings in City center (BCC) arise from system, which include so many properties. First, interest to understand building as a system with all materials, infrastructures, details, intangible cultural heritage which impact in details in buildings. Second, HB or BCC are so important to understand our history and they are like a books which content history of knowledge of engineering and arts . Third, properties which involved to real estate value, but do not come out from buildings, like a traffic, sun expose, distance between social buildings (hospital, BUS station, Railway station, noise, air pollution, etc). HB or BCC is part of higher/bigger system. Real estate represent in many reasons interdisciplinary poligon and is part of the whole global system. Existing building (EB) as a system and part of whole system cause expansion knowledge which we need to valuating HB or BCC. In many reasons this building it should not be the subject of capital, therefore, of supply and demand. Valuation of HB or BCC needs attention to understanding difference between buildings even if they standing in the same street or part of city. How get enough knowledge to help valuating HB or BCC? The answer is in the big data base. The goal of database is to be a simpler and faster way to gain knowledge about the object and system. Information technology allow collect wider range of information faster and better than in the past and at the same time, that the same informations change into the necessary knowledge. The paper showed two systems which can use into HB and BCC valuating.

**Keywords:** Real estate value, Heritage building, Building in down town, System, Knowledge management

## 8.7. The Impact of Level of Education in the Development of Real Estate Sector

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Feeling the need and importance of the level of education in the growth and development of the real estate sector there will be assessment of the general elements that will affect the growth and development of the real estate sector in Kosovo. Through this study, the practical, theoretical and scientific reasons are explored, which, as such, are present in Kosovo. The survey was conducted with entrepreneurs of several different regions in Kosovo. The main study question, in this study is: How does the level of education affect the development of the real estate sector (increase in real estate demand). During the study, the hypotheses raised after the results have been found that these hypotheses largely stay. The results confirm the theoretical expectation of a positive effect of the education level on the growth of the real estate sector. Namely, hypothesis 1: The development of the real estate sector in Kosovo and their development approach is influenced by the level of entrepreneurship education, ie according to our analysis the level of education positively affects the growth and development of the real estate sector. And the hypothesis 2: The development of the real estate sector in Kosovo is largely affected by the experience of entrepreneurs given the market structure and economic structure of the transition countries based on the analysis that we see that business experience also affects the development of the real estate sector. Consequently, this study aims to serve public institutions, governance, higher education institutions, entrepreneurs, but also other people by making clear the importance of the level of education in the development of the real estate sector.

**Keywords:** Sector, Real estate, Growth, Development, Education, Kosovo



## **8.8. Residential Community Management Software: A Case for the Use of 4.0 Technology**

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The rise of cities and population in urban areas has led to the development of apartment blocks and the construction of homes on a common land, where facilities and costs are shared between co-owners. These are commonly Homeowner Associations (HOAs), where co-owners appoint a governing body amongst the owners to oversee the actual completion of maintenance, budgeting, accounting and other related tasks. The governing body work is voluntary without monetary retribution for members, except for the employees contracted by the HOA. The resulting problem in many cases is lack of incentives for the owners and the board to devote the time that these tasks require. This paper describes the issues encountered in HOAs and outlines a case for the use of 4.0 technology in residential community management software to tackle the existing problems.

## 9. New Housing Forms

### 9.1. An exploration into smart environments for stimulating encounters for older adults with dementia in in-patient facilities

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**Problem field:** the demand for (smart) dementia-friendly infrastructure is rising as the Netherlands faces an increasing number of older adults with a form of dementia. Social interactions are vital to quality of life, however, people with dementia experience increasing problems with social contact as the disease progresses (Jonker, Verhey & Slaets, 2010). One way to stimulate social health is by enabling different forms of social contact, ranging from observing social interactions to active (digital) social interaction using (non-)verbal communication (Hubbard, Tester & Downs, 2003). Literature shows these forms of social interaction can decrease agitation and aggression, in turn contributing to a decrease in medicine use (Ballard et al, 2018). International literature shows the benefits of social contact, but many (smart) interventions are aimed at identifying activities, tracking wellbeing and giving context-aware functional feedback (Cook et al, 2010). Research from the Netherlands (Mohammadi, 2010) shows that smart technology is widespread in in-patient facilities and seems to benefit its inhabitants. However, smart environments for stimulating social contact have not been studied so far. **Purpose of Study:** the aim of this study is to explore where and when encounters for older adults with dementia in in-patient facilities can be stimulated using smart technology and physical infrastructure and to what extent smart environments can contribute to stimulating social interaction. This paper regards smart environments as a seamless integration of technological and architectural interventions. **Methods:** this paper examines (smart) environments for stimulating social interactions by using academic literature (n = 55) and over 250 projects and products. However, there are a limited number of examples of smart environments for stimulating encounters in practice and science. **Findings and Results:** both architectural and technological aspects can influence social interaction in this target group (e.g. Mordoch et al, 2013; Marquardt et al, 2014), however these two aspects are researched separately, not combined (i.e. smart environments). Among spatial and technological interventions in in-patient facilities there is a shift visible from supporting to stimulating people with dementia in their daily activities. This has led to a shift from functional ADL interventions to (smart) environments that aim at stimulation through offering (digital) experience-based spaces (e.g. Takeda et al., 2012). However, this research shows that (smart) environments that stimulate social interaction can increase QoL of the inhabitant, but there are few examples of these smart environments for stimulating encounters. **Conclusions and discussion:** combining the shift towards 'stimulation' and the importance of social interaction for this target group could benefit the quality of life of people with dementia in in-patient facilities. Important is that a total integration of technology in a physical space (i.e. smart environment) cannot be achieved without creating a feeling of home for the inhabitant.

**Keywords:** Dementia; Smart environments; Encounters; In-patient facilities; Stimulation

## 9.2. The importance of social connections for older adults in outpatient care setting

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As a reaction to ageing society, government policy in the Netherlands encourages older adults to live independently for as long as possible. Older adults who need care receive support from formal care providers, but for an increasing share are dependent on support provided by informal care providers (Nies, 2015). For receiving affection and support, older adults therefore become increasingly dependent on their own social network (SCP, 2014). This raises the question of how social contacts are organized in outpatient care settings, as these often do not take place in an organized context and in designated areas, as is often the case in inpatient care settings (Turcotte et al., 2015). Purpose of study: This discussion paper aims at mapping the possible social consequences of the transition from inpatient to outpatient care settings for the well-being of older adults with a care demand. The paper will focus on the questions; why are social contacts important for the well-being of older adults living at home, and what is the nature of these encounters? Main argument: Based on the resources perspective (Hobfoll, 1989; Diener & Fujita, 1995), it can be argued that social resources are part of basic human needs, as they provide people with affection, social support and social integration. Apart from that, social resources can buffer people from negative life events, such as the loss of a partner or a decline in health (e.g. Popenoe, 1993; Cohen & Wills, 1985). These social resources can be defined as social capital (e.g. Bourdieu, 1986, Blokland & Savage, 2008 and Putnam, 2001). However, social capital can only be regarded as a 'resource' when it comes to social bonds that are intimate. In the literature, however, arguments are also given why non-intimate relationships may be important for the well-being of older adults living at home. It is argued that random, but repeated encounters in public space can lead to public familiarity (Blokland 2003 & 2009), which is hypothesized to be related to people's feelings of safety and security in their living environment. Conclusions: The reason why social contacts can be important for the well-being of older adults living at home is twofold: 1) intimate ties with people in the neighbourhood can provide in social capital, and 2) random encounters in the neighbourhood can provide in public familiarity. Therefore, future research should focus on questions that link housing typologies for older adults directly to social relationships, both intimate and non-intimate.

**Keywords:** Social capital; Public familiarity; Senior housing; Outpatient care settings

### 9.3. Age-friendly and smart cities

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Twenty-first century will be marked by two processes – population ageing and urban growth. Population ageing is the most pronounced demographic process in modern society. It is characterised by an increase in the share of the elderly in society and an increase in the average age of the population. Simultaneously with population ageing, the world is facing rapid growth of cities and the urban population. Population ageing and urbanisation are largely conceived of as problems of the modern world: among other things, population ageing increases public expenditures, and urbanisation leads to an increase in built-up areas, excessive use of natural resources and pollution. Nonetheless, both processes represent the apex of human development in the past century and at the same time the main challenges for this century. People live longer primarily thanks to improved healthcare and social conditions, and urban growth is linked to society's technological and economic development. Therefore, population ageing and urban development should be two interconnected processes. Since a couple of years, two concepts have been applied to address the challenges of ageing and urbanisation. One is called age-friendly cities and the second smart cities: an age-friendly city as a place that has an inclusive and accessible urban environment that promotes active ageing (World Health Organisation, 2007); a smart city, on the other hand, is an urban area that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness (ITU, 2015). In this article both concepts are presented and compared to find out how cities could be age-friendly and smart at the same time. The results indicate that concepts of age-friendly cities and smart cities are linked, and also that due to the rapidly changing society the combination of both concepts should have to be taken into account while planning urban environment.

**Keywords:** Population ageing, Urban growth, Cities, Urban planning

# 10. Planning

### **10.1. Negotiations between developers and planning authorities in urban development projects – the case of Oslo, Norway**

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Since the first nationwide planning law of 1924, Norwegian statutory planning has provided market actors with extensive formal rights to initiate and prepare detailed zoning plans for development projects. From mid 1990s, densification of the urban fabric has been the stated Norwegian national policy for urban redevelopment. For the same period, local public authorities has relied on private property development as a means for urban development. Most often, urban densification and transformation in Norway would include the approval of a new detailed zoning plan – initiated and prepared by a private developer. Usually this process includes negotiation between the municipal planning agency and the private developer on land use and building possibilities, prior to the final approval of the plan by the municipal council. However, it is claimed that the rather rigid and legally binding nature of Norwegian statutory planning leaves too little room for such negotiations. Hence, a system of informal strategic land-use plans has been adapted as framework for negotiations, aiming at interest-based bargaining rather than positional bargaining. It is believed that such informal plans could guide the negotiations, establish trust between the parties and through this, the stable and predictable conditions necessary for interest-based bargaining. This paper reports on findings from negotiations throughout the process of preparing detailed zoning plans in Oslo, Norway. Four planning processes, involving two major developers – for both developers one plan including an informal strategic land-use plan and one without – are investigated. Contrary to common beliefs the findings indicate that trust are not dependent on the existence of informal strategic land-use plans, but heavily rely on participatory behaviour, in particular the ability of the public planning agency to provide for stable personal relations. Negotiations ending in positional bargaining happened when the public planning agency was unable to provide the same case manager throughout the process, and made frequent exchanges throughout the process of negotiation.

**Keywords:** Statutory planning, Indicative planning, Real estate development, Negotiations

## 10.2. Only possible with regular layout when shortened. The Problem of leasing agricultural land in Slovenia

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We have witnessed major changes in the structure of agricultural holdings in Slovenia in the last fifteen years. The number of agricultural house holdings is decreasing. The existing farms are bigger due to the increasing share of leased areas. The Agricultural Land Act regarding the leasing of agricultural land contains special provisions that deviate from the general arrangement of the lease contract in the Obligations Code. The conclusion of a lease agreement for agricultural land is possible after the publically announced offer on the administrative unit. The administrative unit, in the area where the agricultural land is located, approves the legal transaction with administrative act. The lease agreement for agricultural land is concluded in writing and entered in the land register and in the land cadastre. Due to the complexity of the leasing arrangements, the owners of agricultural land rarely comply with the provisions of the ZKZ. The provisions of the ZKZ in practice take into account only by The National Farm land and Forest Fund, responsible for the land owned by the state. Private owners rent agricultural land to farmers outside the provisions of the ZKZ. Most of these types of contracts are not entered in the land register or the land cadastre. In this context, the question arises 'Whether are the contracts for transfer of land use, concluded by the owners of the land without prior public announcement and without the approval of the administrative unit, in contrary to the compulsory regulations and as such null and void'. There is a great interest among agricultural holdings wishing to continue agricultural activity to lease agricultural land. Increased demand usually results in the higher price. In Slovenia, there are no official data on the amount of lease payments for agricultural land. Due to mainly informal leases there is no official leasing market of agricultural land. Only the leasing price of the state owned land is known. Those are determined by the National Farmland and Forest Fund and, according to some estimates are lower than the rental price paid by the tenants for privately owned land. In this paper it will be presented the normative arrangement in the Slovenian Agricultural Land Act (ZKZ) and compared it with the arrangements in Austria, Germany, Switzerland, Italia and Croatia. It is clear from the comparative analysis that none of the presented legal systems leasing of agricultural land leaves entirely to free market, but all countries have specific regulation for the leasing of agricultural land. As a rule, they are not as complex as in Slovenia. It is also possible to establish that none of the countries has been able to establish such public-law control, which would regulate the field in a satisfactory way. Arrangements for the leasing of agricultural land are therefore either subject to continuous changes or in practice (as in Slovenia) are not implemented.

**Keywords:** Agricultural land, Leasing price, Regulation



### 10.3. Multimap as a Method for Strategic Planning – Tool and Practical Results and Experience as Base for use in Urban Areas

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The objective of the paper is to present results using multiMap method, which is a tool for mapping performance of building portfolios as an input to strategic planning. MultiMap was developed in 1997 in cooperation with Oslo Municipality (building portfolio of app 4 million m<sup>2</sup>) who wanted to know state of art as base for “what to do” about technical and functional upgrading. The model has so far been used for strategic portfolio analysis of approximately 35 million m<sup>2</sup>, mostly hospitals and buildings in the municipality sector, but also adapted to cover roads, parks and nautical installations along the total coastline of Norway. Project initiated by Nordic Ministers, the methodology was used for a common Nordic project on Sustainable Refurbishment (SURE), finished in 2015, to obtain and upkeep “Well- being” for users and owners of buildings. Living environment is the totality in our daily life described as the social and physical framework. During our life’s social needs are changing. It is about safety, security, activity, rest etc Good indoor environment is not enough in itself, but outdoor in streets, parks, shops, cafes, schools, places for work, medical treatment and activities are all a part of the total environment. Also increasing population in urban areas ask developing Urban FM (Facility Management). This paper presents findings in real life projects, improvements and practical use of results so far and possible new areas to be developed. Methodology/approach: The methodology used in the model are both qualitative and quantitative research methods. A substantial part of getting information to the model is based on structural collection of data and knowledge already present in the actual organization. This gives quick and cost efficient access to information at required level of accuracy. Result: The results and experience of the practical use show that the model is generic and can be implemented for strategic development of urban areas. Practical outcome will be a better possibility to see buildings and space / areas between as an integrated facility management puzzle organized as Urban FM. Practical implications: The research is important to increase the understanding of Well-being in urban areas.

**Keywords:** Building portfolios, Urban development, Facilities management, MultiMap, Strategic analysis

#### 10.4. Roadmap data driven real estate management in the municipality of Groningen

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In order to achieve social objectives, the Real Estate Agency of the municipality of Groningen wants to steer an innovative approach to the social real estate portfolio. The use of data and information technologies, or data driven work and control, provides insight into the effectiveness and efficiency of the portfolio. This roadmap contains, in addition to a theoretical framework, a step-by-step plan that describes the process for data driven real estate management. The starting point here is to invent step by step, as data driven real estate management requires a different way of thinking and doing. Actionable insights are created so that strategic steering becomes possible. The dashboard to be developed forms the basis for entering into dialogue, making decisions and drawing up long-term goals. The outcome is a proactive, agile, future-proof organization that is capable of responding to a changing environment and steering towards the highest possible social return. The rise of Big Data allows us to gain insight in a different way into what will happen and steer in the future. Smart Cities, smart devices and other examples of the Internet of Things - not only people are online, but also things - generate valuable data and make it easy to share. And the introduction of Blockchain in real estate creates a different way of transferring value (Veuger, 2017). These are examples of the use of data and technological possibilities that cause major changes, both positive and negative - and have an influence on and potential value for the real estate world. But how can the municipality of Groningen use new data and information technologies to strategically manage the social real estate portfolio?

**Keywords:** Big data, Municipality, Dashboard, Social return

## 10.5. Urban Land Values and Urban Forms - Case study: Pristina Municipality

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Like any other country in Europe, Kosovo has undergone many drastic changes over the years creating a quality of life that would be enjoyable for the population without endangering the environment, the animals and plant world. Major residents' demand for a better life away from noise, pollution, uncertainty and other problems that lie in the social and economic context have sparked the realization of suburban neighborhoods. This movement of the population to create a safe area and to create a better quality of life for themselves and future generations has affected private construction by utilizing agricultural land. The European Environment Agency, with the utmost concern for the growth of private neighborhoods in rural areas, has devised a program on how to reduce these population movements that are, with or without knowledge, affecting fertile land losses. Kosovo has a small area as a state, and cities are slowly growing, as a result of the growth of industrial areas in the suburbs of cities. Concrete case is Pristina, which has increased the urban boundary and now the enormous constructions only have taken up important place to meet the demands of the inhabitants. The productive lands are damaged because it is known that the more productive land that is, the more prices will find an increase thus giving real estate a huge value. The aim to have a compact city just fades because of sprawling buildings, including private quarters. This distribution of the population is accounted for as a negative phenomenon with which Pristina and neighboring municipalities are facing over the years. Apart from enormous constructions, ignoring sustainability indicators is another battle faced by residents themselves. By ignorance or unconscious, the quality of life required by residents is not at the right and long-term level. Governmental and municipal institutions should reflect on the constructions and losses of agricultural land being made in favor of a certain group of people. This reflection would be very necessary because now is the right time to come up with a plan to face the present and we have the potential to provide the best for human kind and environment.

**Keywords:** Productivity and Value, Urban Form, Urban Sprawl, Land Sprawl, Urban Sustainability, Real Estate

## 10.6. Easement as the element of monetization of real estate and insurance for infrastructural and energy investments

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The element of easement in commercial investments, as well as in cases of infrastructure and energy investments, is often an overlooked element that can accelerate the exploitation of land, buildings and/or their individual parts. At the same time, there are several positive aspects pertaining to usage and implementation of easement, both for the owner of the real estate as well as for the potential investor, irrespective of whether the investor is a private or private legal entity. In the paper, my goal is to illustrate following: easement can have a positive effect on the development of infrastructure and energy investments. In the case of energy facilities, easement may have a positive effect on the real estate valuation. Easement represents a solid element of insurance and/or collateral in cases of energy investments and can be perceived as a major reduction of business risk for both the owner of the property as well as for the investor. A specific joint venture case in renewable energy investment will be described, where the easement right was used as a key element for the realization of the project; on the basis of theoretical discussion and analysis of selected case and previous academic research, some guidelines for faster, more efficient and cheaper developments in the field of infrastructure and energy investments, will be provided.

**Keywords:** Easement, Energy investments, Infrastructure investments, Real estate planning and development

## 10.7. The Human Context in the design of architectures

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Current developments in design, construction and engineering make it possible to design and construct buildings in a factory like manner. They can lead to the rigorous application of rationality. This feeds the debate on whether this can lead to sustainable livable spaces, because rationality only focuses on the functionality of a building. In that approach, that began at the beginning of the 20th century, the design of a building results from the intended use. The criticism of this approach is that it leads to structures that feel like and look like machines. It does not meet the requirement of Vitruvius ( $\pm$  85 - 20 B.C.), the first known architect who published a design approach on architecture, that the realization of both practical and symbolic requirements in a building are basic characteristics of the architecture. More than 2000 years later, architecture can still be regarded as a powerful instrument to enforce cultural and societal values. This position on architecture places great emphasis on the architect's social responsibility. It emphasizes that enforcing social and cultural values are functions of architecture and should always be considered in the design phase. In the debate on creating livable spaces the question is raised whether an approach, that can be described as 'design for people' or 'living architecture', is an economically feasible and realistic alternative to a pure rationalist design approach. Design principles and case studies in design literature suggest that it can. They support this design approach that focus on understanding the relationship between people, buildings and cities. However, there is one caution. From social theory it is known that fundamental differences exists regarding the philosophical stance one can take on this design debate. Each stands in its own right and generates its own distinctive design approach. This difference is so fundamental that it makes the debate between practitioners of these different design approaches pointless. But that does not detract from the research findings that the 'living architecture' design approach has been proven to be valuable and research is needed to determine how modern technologies can support that approach.

**Keywords:** Livable spaces, Rationalism, Living architecture, Design for people, Fundamental differences in design approaches

## **10.8. Revitalisation of Railway Stations in Regional Urban Areas – Grosuplje Station Best Practice Example**

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Regional railway network is in many countries in subordinate position according to main railway lines. In many cases, regional lines consist around fifty percents of the whole network, but only small part of the maintenance budget is allocated to them. On the other hand, railway stations and areas around them are often burden for the owners from the real estate perspective. But there is a paradox. The new settlement pattern from the last thirty years shows migrations from big urban cities to smaller suburban or regional areas which generates the new regional urban centers with new mobility demands. Is this opportunity or threat for the infrastructure managers, railway undertakings, state and municipality authorities and real estate market? In the paper best practice from Grosuplje municipality as larger suburban municipality regarding the modernisation of the regional railway network and station is described.

## 10.9. Urban planning as an instrument of better standards of living – Case of shantytown

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**Purpose:** The purpose of this paper is to analyze the regulation on the construction of shantytowns to provide a better standard of living for its citizens. In this paper, we will address the urban trends in connection with crime, violence, unlivable standards, lack of schools and transportation. Governments should aim to provide certain necessary needs such as: clean water, safe waste disposal, safe building infrastructure, security, police patrols and units, job security and job skills. The introduction of shantytowns in South America came as a result of a major migration from rural areas into urban areas to obtain financial security. The main research question is what are the minimum requirements of urban planning for increasing the security and better standards of living in shantytowns?

**Design/methodology/approach:** The research is a literature review from the fields of urban planning, economy, poverty, security and standard of living. We will analyse a positive case from Peru's governmental shantytown development.

**Findings:** From the literature review, it is seen that the development of shantytowns can either negatively or positively affect the economic growth of a country. In Ecuador, we learned that all shantytowns are constructed by bamboo material, which creates a risk hazard especially in the period of earthquakes and heavy floods. Shantytowns expanded when the poverty increased due to the latest global economic crisis leading to the highest unemployment rate in South American countries. Due to the foreseen circumstances in shantytowns, the effect that unclean water and insecurity has decreased the life expectancy of its residents. From the case study, we can learn that the development of Villa el Salvador in Peru was a successful shantytown with the partnerships of the central government and private companies working as allies to provide safe housing as well as job security.

**Research limitations/implications:** Focus on Latin American countries; mainly Ecuador, Peru and Colombia.

**Originality/value:** The value is to see the benefits of government involvement in the urban planning of shantytowns, education of people, increasing the skills of its residents, lowering unemployment and inclusive economic policies can improve the access to security, better standards of living and housing quality.

**Keywords:** Urban Planning, Shantytown, Standards of living, Security, Economic shocks

### 10.10. Exploring the practice of ‘Multiple-plan Coordination’ in Xiamen City from a ‘Cross-Sector collaboration’ perspective

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As a developing country, China's research on urban planning and the formation of urban planning laws' system are relatively late compared to the western countries. In 1989, the Chinese government introduced the first urban planning law, "Urban Planning Law of the People's Republic of China". Until 2008, the "Urban Planning Law of the People's Republic of China" was updated as the "Urban and Rural Planning Law of the People's Republic of China". Due to the short period of development, there are many contradictions and shortcomings in China's urban planning system. Especially contradictions between multiple plans and the various planning departments. therefore, the Chinese scholars in 2001 proposed to integrate multiple planning together, so that their planning can be more effective. that is the "multi-planning united" theory ("multi-planning united " generally refers to the unity the overall urban planning, land use planning, economic development planning and environmental protection planning, but, for different cities the definition of " multi-planning united " may different). However, the differences between the various footholds of the planning, the contradictions between the departments in charge, the differences manner of developing a city space and the dissimilar planning period have cause many troubles in Multi-planning united work. At present, most of the studies on the multi-disciplinary and unification in mainland China focus on technical aspects, legal aspects and urban space governance. There are few issues concerning the coordination or cross-departmental governance of the various departments in the process of multi-disciplinary integration. In Xiamen, " multi-planning united " implementation has made good progress in recent years, it was beginning at 2014, based on the experiences and lessons learned from other cities such as Guangzhou and Shenzhen, and reforming urban governance through technological integration and institutional reforms. Today, Xiamen's planning system are gradually improved, more and more planning departments are achieving a higher level of information sharing, coordination and so on. This study will take Xiamen as an example to study the game between departments in the process of the implementation of " multi-planning united ". Through the relevant theoretical framework of crosssector collaboration(Bryson 2006), we will talk about leadership、 boundary organization and other related concepts in Xiamen's " multi-planning united ". Analyze what kind of contradictions and difficulties the local government departments had faced, and their efforts to solve those difficulties. This is of great significance for future analysis and to solve interdepartmental coordination issues. Also, very important for promoting the effective implementation of "multi-planning united" in Xiamen City and other counties in the future.

**Keywords:** Cross-Sector collaboration, Urban planning, Multiple-plan coordination, Planning policy, Xiamen



### **10.11. Urban Planning as a tool for Westernization of Turkish Cities in the late Ottoman and Early Republican Periods: Bursa as a Case Study**

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The attempts of the Westernization of economy, management policy, and urban development in Turkey have began in the decline period of the Ottoman Empire in 1830s and have continued in the establishment period of the Turkish Republic and thereafter. In Ottoman Period, westernization have been seen as a reorganization process of military, local government services and urban management, while it have been seen as a reconstruction process of urban, social, and economic development of Turkey in Republican Period. The urban morphology of many Turkish cities has been reshaped due to the Westernization attempts on different fields. This paper focuses on discussing the effects of westernization efforts on the urban development of Turkish cities. Bursa, which includes the traces of urban development decisions of western educated local governors and western planners, was chosen as a case study.

**Keywords:** Turkish Westernization, Foreign planners, Urban planning, Reorganization, Reconstruction

# 11. Public Real Estate

### 11.1. Public real estate in transition: The quest for efficiency, flexibility and legitimacy

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In our paper we go into major changes in the financing and the organization of public real estate in The Netherlands and discuss the financial and societal impact of these reforms. The paper is based on the audit findings of five audits on public real estate that are performed by the Netherlands Court of Audit (NCA) as part of its 'public real estate audit program'. These audits concern: (1) the foundation of a national real estate agency, (2) the centralization of real estate in the police sector, (3) the sale of real estate by the Ministry of Defence, (4) the decentralization of the real estate management in health care (the cure sector) and (5) real estate management at universities, being autonomous public bodies at arms length. Three intertwining developments at the central government level have led to radical changes in the organization and financing of public real estate in The Netherlands: (a) budget cuts in combination with efficiency targets, (b) new ways of organizing work (more flexible office concepts, less office space per person) and (d) ideology driven choices for a central or decentral responsibility for real estate management. Although the developments in every sector (police, health care, defence, education) differ, the institutional reforms can be summarized in three keywords: centralization: for example founding of a central real estate agency or centralization of the national police; sale of public real estate: as a result of the centralization policy and new ways of working (see above) less public real estate is needed and existing real estate has to be sold; 'autonomization': health care organizations and schools for secondary and higher education have become more autonomous since the late 90's of the past century and are thereby responsible for the management of their real estate and their own internal checks and balances. The above mentioned audits include a number of positive findings, but also some alarming conclusions: the government doesn't always have a complete insight in all the relevant costs and benefits of its real estate like barracks, police stations or offices. This can lead to inefficiency in the exploitation or to a selling price that is too low. short term thinking often prevails. But quick wins sometimes lead to financial write downs or higher costs of maintenance in the long run. The price the government can get is often the dominant criterion in a selling process. The societal impact, for instance the impact on the liveability of a neighbourhood is not included in the cost-benefit analysis. Sometimes it can be very legitimate to accept a lower selling price if this contributes to a higher societal impact. This kind of considerations should be made transparent. In some cases public organizations lack the capacity to manage the real estate in an effective and efficient way to manage their real estate in an effective and efficient way. This is sometimes the case because they are unexperienced (small schools or health care organizations) and sometime because internal checks and balances are not developed very well. This had lead to some costly public real estate disasters with hospitals and schools. Public accountability and transparency about value and volume of real estate,

cost-benefit analyses, housing costs or financial obligations need to be improved. Besides this, public actors like national and local governments can and should share their plans for selling, buying and renovating their public real estate in order to create a more efficient and effective public real estate portfolio and reduce possible negative trade-offs.

**Keywords:** Public real estate, Netherlands court of audit, Real estate management

## 11.2. Managing Municipal Real Estate in 2035

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Much has been written on problems of the current (linear) economy and as a result have challenged the current economic system. This paper is positioned to look ahead beyond today and exploit the days of tomorrow. The linear economic model is no longer sufficient with the increasing demand and overpopulated planet Earth. Concepts such as “Circular Economy”; “Industry as a Service” have increasing merit to revolutionise the current systems and practices. The purpose of this paper is to summarise various angles of approach that give insight in the possible effects on the way municipal real estate could be managed. This paper explores the potential impact of “Industry as a service” and how this could be appealing for the real estate market and municipalities in particular. This concept implies no ownership of the real estate, but only paying for the use of it. We explore how municipalities could utilise such services to contribute to their (policy) goals and manage risks. Key aspects contributing towards (policy)goals and managing risks are effectiveness and efficiency. A new economic model will instigate several changes, for instance: how will municipalities be charged for its usage and why would this be appealing? If regulated, this magnifies the importance of steering upon space utilization for both municipal and public user groups. Furthermore, this paper explores the expected role of Dutch municipalities in 2035, how municipalities go about such practices and how the municipal real estate organisation and the steering on housing issues is likely to look like. Moreover, we question the need for a real estate organisation if real estate products are commercial and leasing is based on space utilization and duration. Furthermore, such implementation would instigate a change of firm culture – this paper will question the challenges and what the changes would yield. Key components such as flexibility, strategic housing steering, sustainability, big data and blockchain will be integrated in the overarching new economic model. In addition, cost based pricing methods will no longer be an issue as it will be standardised and integral of the leasing product, proposed in the new economic model. Blockchain is considered to play a vital part in the transparency of transactions and payment methods. Method: On the basis of our experience, actual developments and forecasts, we create a vision of how future municipalities will manage their housing issues effectively in say 2035 when ‘Industry as a service’ has become the norm. We structure the various angles of approach by the Mc Kinsey ‘7-S model’ and draw conclusions and make recommendations for the current municipal real estate challenges.

**Keywords:** Industry as a service, Future real estate organization, Circularity, Sustainability Innovation

### 11.3. A method to revalue religious heritage socially and financially

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Since 2011, Flemish local and church councils are asked to decide by means of church policy plans on which parish churches may or may not be retained for service by merging parishes, due to a growing shortage of priests, namely 237 for 1800 parishes. Five years later, the debate on forms of shared use, ancillary destination, re-use and even demolition of the parish church is being held in approximately 150 (of the 308) municipalities. Concrete action plans to actually implement the church policy plans seem to be lacking for the time being. Amongst the realized re-destinations in Flanders, we mainly count chapels of monasteries, schools or hospitals instead of parish churches. And no strategy has yet been issued or available to determine how to deal with locally with the 1200 Flemish monastery and abbey sites, where the current staffing invariably thins out due to aging. Preliminary conclusions from the Collectief32 survey show little prospects for the future from the aging congregations for their material heritage and little insight into what means they can use to revalue this. Taking into account the very strong social aspect of religious heritage, Flanders searches for how to set up participatory processes. Voices are raising to treat the religious heritage (RRH) within the larger picture of "social/public real estate". This means reevaluate them as and/or amongst facilities in which public and/or social services for livable and vital neighborhoods and neighborhoods are offered by or for citizens (partly) by public resources, from a recognized social interest (Veuger et al., 2017). But even if ecclesiastical and public authorities are sitting around the table with citizens, the economic laws of supply and demand play a part in the, to date, non-transparent real estate market. For the time being, no proven strategy has been developed to support these stakeholders in decision making to more "socially responsible real estate" (SRR), with minimization of costs and optimization of income, both financially and socially. The need for fundamental research into a workable approach to the "reevaluation of religious heritage" (RRH) involving community, church & state and market heritage in co-creation is imminent. A new syntax and vocabulary is proposed to run processes to revalue the social and spiritual potential of religious heritage, in addition to the real estate value. In what way can RRH be seen as SRR? What is the role of the social cost-benefit analysis (SCBA) in the co-creation process? What does the "developer 2.0" look like in this co-creation process? Suppose we define a "2D-process", the development process with a lot of tug-of-war between the classic "developer 1.0", architect and law? This 2D-process yields a classic product, a "2D-product": real estate whereby the ground is equated to financial return and the building is equated to its one function. Can we then imagine a "5D-product", where land, use, building, financial and social return would have an equivalent meaning, instead of being reduced to each other? This 5D-product could be achieved through the intermediation of a "developer 2.0" in a "5D-process" with all the different stakeholders and in particular also the citizens, civil society and knowledge institutions with expertise in this area, provided a description of a new framework for the "developer 2.0" of HRE as MVV. A next step will be to test the first conclusions from the preliminary questions with data from a certain Flemish city (or cityregion) and/or the opportunity to effectively start a pilot 5D-process and so on to refine and expand more and more, until sufficient number of lessons learned can be lifted to a scientific story.

**Keywords:** Revaluation of religious heritage (RRH), Socially responsible real estate (SRR), Social cost-benefit analysis (SCBA), 5D-product and 5D-process

#### 11.4. Energy performance of social real estate in the Netherlands

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There has been an increased effort in recent years to improve the energy performance of non-residential real estate in the Netherlands. An energy performance certificate is required at the moment of transaction and in 2023 an energy performance C-certificate (certificates run from A to G) will be compulsory for office buildings. However, additional measures will be needed to meet CO2 reduction targets. Substantial *energy saving potential exists in social real estate*. In this study, detailed nationwide available information is used to assess the energy performance in this sector. We look at geographical differences and the effort required for social real estate owners to improve energy performance. Results showed that the energy performance of 70 million m<sup>2</sup> (59% of all social real estate) would need to improve to comply with an energy performance C-certificate. This increases to more than 90 million m<sup>2</sup> (80%) for an A-certificate. Differences in energy performance between municipalities were found but no clear pattern in regional distribution was observed. A substantial effort to improve energy performance is needed in most municipalities. In 75% of Dutch municipalities more than half of social real estate was found to have an indicative energy performance D-certificate or worse. We found that the energy performance varied among different types of owners. Not surprisingly, the greatest energy saving potential was found in social real estate owned by the government and the non-profit sector. However, by primarily focusing on these stakeholders, opportunities for improving the energy performance in social real estate would be missed. This is because a fifth of social real estate with an unfavorable energy performance is owned by commercial and private parties. The current research identifies promising locations and relevant stakeholders for improving the energy performance of social real estate. More detailed information about the location, building and ownership will be necessary to identify concrete local energy saving opportunities.

### **11.5. The effect of indoor environmental conditions in classrooms of The Netherlands on educational outcome**

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Teachers and students need good learning environments to perform well. In this study, it is pre-supposed that the spatial properties of classrooms are important facilitators of the educational process. Ideally, school buildings in general and classrooms in particular should influence the educational process positively by providing a healthy and comfortable built environment. A healthy and comfortable indoor environment is provided by optimal conditions for IAQ, thermal comfort, acoustic comfort and visual comfort. A pleasant temperature, fresh air, good soundscape and lighting conditions will support the in-class tasks of lecturers and students. But do schools provide optimal environmental learning conditions? Maintaining adequate ventilation and thermal comfort in classrooms could significantly improve academic achievement of students. A first orientating literature study reveals that that classroom conditions are far from optimal and in some cases even unhealthy and affect the performance of teachers and students negatively. Overall, evidence suggests that poor indoor environment quality in schools is common and adversely influences the performance and attendance of students, primarily through health effects from indoor pollutants. Based on this evidence, it is highly recommended to improve environmental conditions in classrooms in higher education in The Netherlands by offering a better indoor air quality and thermal conditions and by improving the acoustic and lighting conditions.



# 12.RICS

### 12.1. How does Sense of Security Impact on Real Estate: General Review

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The goal of the study is to answer the question how the sense of security impacts on real estate value. We found out that in general the international literature shows a strong evidence of the effect of crime in large urban areas, particularly on housing prices. The housing and neighborhood quality had an impact on satisfaction with the local physical environment and perceptions of safety. Fear of crime and the direct costs associated with property crime may discourage home-buyers, and catalyze a downward spiral in neighborhood status. A comparison of the results of existing research shows a clear picture of the correlation between real estate prices and the sense of security. Of the seven different types of crime investigate, only robbery and aggravated assault crimes (per acre) exert a meaningful influence upon neighborhood housing values. We assumed that the sense of security in neighborhood is strong connected with level of robbery and aggravated assault crimes. The results show that if the level of this crime is low, then the impact on real estate prices is low (0.1% to 1.0%). We estimate that in the given case the participants would also express a rather high degree of security. In the light of the above, we believe that with measuring the expressed degree safety of participation in observe neighborhood we could predict the impact on the values of real estate. This could help valuers of real estate property values in determining the market values in certain neighborhoods.

**Keywords:** Sense of security, Real estate value, Fear of crime, Neighborhoods

## 12.2. The added value of photo elicitation in explorative participatory research.

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This research paper aims to explore the advantages and limitations of photo elicitation, a relatively new creative research method, for mapping place experiences. A 'place' is created by people, by attributing a sense of meaning to space, on the basis of their memories, experiences, imaginations, and emotions (Trell, Van Hoven, 2010). To measure these underlying aspects of place, traditional research methods will not suffice, as they do not stimulate people to recall experiences. Compared to more traditional research methods, photo elicitation is hypothesized to be a more suitable method for gathering information about people's senses related to space (Trell, Van Hoven, 2010; Harper, 2002; Deacon, 2000; Hannay, 2013; Wang, Burris, 1997). In our bottom-up research project in two Dutch villages<sup>1</sup>, we examined the needs of the residents regarding their living environment by using a mixed methods design in which we combined traditional methods, such as in-depth interviews, with the creative method of photo elicitation in order to map livability. In both villages people were asked to photograph places in their living environment that make them feel at home, involved, proud, (un)safe or (un)satisfied. The photo study consisted of three research phases. During the first phase, participants were asked to take photographs of specific places in the village and in their home related to the above-mentioned aspects. The second phase of the study consisted of a meeting in which the participants together with the researchers commented on and categorized the selected material. During the third phase, the categorized data was analyzed by scholars with social and spatial backgrounds. The results of the photo elicitation studies imply that this method has a clear added value when mapping people's experiences, emotions and memories regarding their living environment. The results addressed themes such as the need for autonomy, the identity of the village, belongingness and the feeling of home. Themes, regarding the experience of place, that were addressed to a lesser extent in the in-depth interviews that were held prior to the photo elicitation studies.

**Keywords:** Creative research methods; Participatory research; Mixed methods approach; Liveability; Small villages

# 13. Social Infrastructure

### 13.1. Life Cycle Social Needs and the Role of Urban FM

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**Purpose:** the Living environment is the totality in our daily life described as the social and physical framework, and during our life, social needs are changing. It is about safety, security, activity, rest, etc Well-being for humans is the totality of indoor – and outdoor environment, social security and total economy (in streets, parks, shops, cafes, schools, places for work, medical treatment and activities). Urban growth and needs for upgrading, aging population who want more accessible social places, high demands on reducing fossil-based energy, etc, are all areas who ask for developing of Urban FM (Facility Management). The paper discusses how traditional Facility Management (FM) role can be developed to an urban FM, as a supporting service in the operational phase of the built environment (building, complexes or areas), with the aim to develop competitive and healthy surroundings with high quality for residence, learning environment, business and spare time. Such development will include many perspectives, such as creating a better environment (exp. sustainable oriented, against gentrification) or better services (exp. assistance/services for older adults, financial models for supporting better living conditions, inter-generation models). **Methodology:** The methodology used is both qualitative and quantitative research methods. It includes site observations; questionnaire as well as interviews with representatives from the four P's (Public, Private, People, Partnership). Knowledge of changing needs within these groups is essential as a base for building up Urban FM. The action may contribute to maintaining a desirable urban area throughout its lifecycle. **Findings:** Urban context is a group of campuses and campuses is a group of buildings. The complexity is about organizing due to different stakeholders. FM experience within buildings and campuses is a good starting point for developing Urban FM. **Practical implications:** The research covers a need that is becoming more important due to changing social needs as the focus on Well-being issues within urban areas are increasing. **Originality/ value of paper:** This paper can contribute to developing Urban FM as an increased area for FM organizations.

**Keywords:** Social changes needs, Urban Facility Management, Business models

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3<sup>th</sup> CONFERENCE OF INTERDISCIPLINARY RESEARCH ON REAL ESTATE

### 13.2. Taxation and investing in the community's infrastructure for ageing cohorts

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In the last 15 years, Slovenia is trying to develop a consensus regarding long-term care and long-term care insurance which would define the services for insured older adults with declined functional capacities so much that are dependent on the help of others for the activities of daily living. Public policies and private initiatives have forced to the forefront of current issues a serious shortfall in capacities of Slovenian nursing homes and other assisted living facilities like sheltered housing. Most local communities are unable to keep pace with demand for facilities needed for provision of services for older persons. Their primary obstacle is financial capacity or capability to invest in the social infrastructure. The paper is presenting the Slovenian community's social infrastructure needs and identifying methods to invest in the infrastructure to meet the demand of an expanding number of old people in the community. Municipal revenues are comprised of various sources. Article 6 and 7 of the Financing of Municipalities Act (the Official Gazette of the Republic of Slovenia no. 123/2006, 57/2008, 36/2011 and 14/2015 - ZUUJFO) listed them: real estate taxes, water vessel tax, real property transaction tax, inheritance and gift tax, gaming tax and other taxes, in accordance with the law governing a particular tax. Financial resources for the municipalities also include revenues from voluntary contributions, levies, fines, concession fees, payment for local services and others in accordance with the legislation that governs individual levies or in accordance with regulations adopted under the law. Municipal revenue also includes the material and financial assets of the municipality, received donations and transfer revenues from the state budget and resources from the European Union funds. Financial resources also include revenue from income tax and other taxes, which are part of the state budget revenue in accordance with law for each fiscal year in the amount of the total municipal expenditure. One of the tax revenues is a tax on property, which is a real property tax comprising of tax on real estate (property tax and the building land use charge) and other taxes for the use of goods and services. Our research focuses only on the revenues from taxes on real estate, which will be soon replaced by the revenue from the new real estate tax, which will replace the current property tax, the building land use charge, and fees for the maintenance of forest roads. New tax legislation will influence the municipal revenue from which a part is suggested to be invested in the social infrastructure. The conclusion is that we have to define standards of social infrastructure in the context of the spatial planning also for providing assisted living facilities for older adults. For the development of these assisted living facilities, a part of property taxes should be assigned. Currently, the municipalities collect 202 Mio Eur of community fees. With the introduction of the new property taxes, there is a plan for an increase in the amount to 330 Mio Eur. Our projections show that Slovenia will need to develop 36000 new assisted living housing units for older persons till 2050. Therefore 60 Mio Eur from this difference per year is suggested to be invested in the development of the assisted living facilities for the provision of the long-term care. To smooth the investment process, the financial plan developed here includes the use of financing with loans from the European Investment Bank.

**Keywords:** Long-term care, Facilities, Taxation, Financial plan, Investments

### 13.3. Social infrastructure that makes the community more sticky and attractive for older inhabitants

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In this article, we present the impact of the level of community care infrastructure on internal migration. Among other factors, the level of community care infrastructure influence the attractiveness and stickiness of municipalities. There are several differences at the local level regarding how the regular care of the older people is organized and how the proper social infrastructure for seniors is developed, but also some national resources can have an important impact. Based on the classification of the typology of community care in Slovenia as clustered by Hlebec, Mali and Filipovič Hrast in the paper “Community care for older people in Slovenia” (Hlebec et al., 2014), where five clusters were obtained via a hierarchical method (k-means clustering), we have calibrated a gravity model where the impact of the level of developed social infrastructure is studied. The main purpose and aim of our contribution are to present a spatial interaction model for studying the stickiness of the municipality of origin and the attractiveness of the municipality of destination for inter-municipal migration in Slovenia for cohorts 50+ and 75+. Using the model, we can analyze the impact of improved social infrastructure on the attractiveness of the municipality of destination and stickiness in origin. In the following, we first define the problem by expounding on internal migrations and their treatment in spatial interaction model, which was developed by Drobne and Bogataj (2005, 2009, 2011, 2013) as well as Bogataj et al. (2004) and Bogataj and Bogataj (2007, 2011): These articles present the impact of the spatial policies and investments in better social infrastructure on migration flows. The next part deals with defining municipal social infrastructure regarding the aging population. In the third section, we present the methodology of research, i.e., databases and the working method. The results of assessing the parameters of migration flow between municipalities and the changes in municipal infrastructure are discussed. In the final section, a case study is presented. The article concludes with a discussion including discussion about the residuals and offers suggestions on future work. The article shows the basic development of the model, the impact of the level of services on the attractiveness and stickiness for cohorts 50+ and 75+ and discuss why in some cases the residuals are very high.

**Keywords:** Social infrastructure, Older inhabitants, Inter-municipal migrations, Gravity model, Attractiveness, Stickiness, investments

### 13.4. Assisted Living Facilities System Development: The Case of Slovenia

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**Problem Statement** – Ageing population is a global trend that significantly impacts the provision of various care services for elderly people. Slovenia and its municipalities are today overwhelmed with applications of elderly people that require institutionalized care services as in July 2018 there are approximately 7,200 people waiting to be accepted for care services in institutionalized care. However, assisted living facilities and / or adjustments to an elderly friendly environment are nowadays becoming viable alternatives to the ones of the primary system focused on institutionalized care from the views of care funding bodies as well as its users – older people. **Purpose** – The purpose of this paper is to present the chronological system development in assisted living facilities in Slovenia in recent years, and subsequently to identify existing challenges in reducing the surplus of demand for institutionalized care. **Design/Methodology/Approach** - An in-depth literature review of existing secondary sources, next to the case study of assisted living facilities in Slovenia are used to examine the current state of assisted living facilities and to provide an in-depth elaboration in challenges remaining in this specific field, especially focusing on the legislative and funding aspects that are discussed on the national level. **Findings** – The findings reveal the high importance of appropriate legislation in providing care services, where in Slovenia there is the need of formally adopting the law on long-term care. The findings also reveal the need for a systematic approach to funding of various forms of care, namely institutionalized care (i.e. retirement homes and home-care) and deinstitutionalized care (i.e. senior living communities). **Conclusions and Recommendations** – Care services system still needs important improvements, as the existing system, which was primarily in the past focused mostly on funding institutionalized care services for elderly people, has proven to be ineffective, unable to satisfy all of its demand. We therefore propose reorganization of existing funding, organizational and other capabilities to provide an overall better organized system for satisfying the rising and ever changing needs of Slovene elderly population.

**Keywords:** Assisted living facilities, Care services, Ageing population, Deinstitutionalization, Funding, Reorganization



### 13.5. Transformation of social ownership – the case of social infrastructure

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The paper deals with challenges of the transformation from social property system (social ownership) which existed in former Yugoslavia to the system of modern property rights for the case of social infrastructure. Social ownership meant, that the society as such was the owner of urban land and most of facilities: for example – in capital city of Ljubljana there was not a single plot of land which would not be included in this regime. The municipality administered this land and gave the right of use to the interested parties such as families, building companies, schools and hospitals, shops, sport associations, etc. The right of use should be registered in the Landbook. However, in practice this right was assigned to users by myriad different documents and the registration process was not necessarily performed properly. In 50s, 60s and 70s large urban areas consisting of housing units, retail office spaces, recreational areas, roads and parks were developed. The right of use was previously assigned to developers for the time of buildings development. After the completion of building process and distribution of housing and other units, the private users were interested to document and register their rights in the Landbook. However, the status of infrastructure which consisted of common elements of buildings such as hallways and parking spaces as well as the status of social infrastructure were not transferred to the communities in many cases. The developers retained their registered right of use, although it was given to them only for the time of construction work, during the construction of buildings, to build the needed infrastructure. These practices had important consequences when Slovenia decided to abolish the concept of social ownership and assign the real property rights to the holders of a right to use the real estate. The rules on transformation were included in various laws, which did not regulate clearly the procedure for acquisition of the right of ownership on social infrastructure and did not observe enough the nature of social infrastructure. One of the main problems was also, that community developers that formally held rights of use on common elements of buildings and social infrastructure became the private joint stock construction companies and were therefore able to register their use rights as private property rights in the Landbook. Only after a decades the communities realised, that they lost their social infrastructure. This inconsistency therefore led to the unjust privatisation of social infrastructure as well as common elements of the buildings and had consequence that even after almost 30 years all the lawsuits regarding the transformation are not yet concluded. Therefore, the subject of examination in this paper is the legislation relating to regulation of this issue, with a presentation of differing theoretical interpretations and practical procedures by the courts. In the introduction the concept of the right of use is presented and compared with the concept of property right. Then the relevant legislation of transformation and court cases are examined. Last but not least the dilemma will be presented of who should be the owner of social infrastructure to serve its cause most properly. To solve this question is of utmost importance for communities and wellbeing of their members, namely the social infrastructure is the glue of satisfied communities.

**Keywords:** Transformation of the social ownership, Privatization, Social infrastructure, Landbook, Judicial practice

### 13.6. Development of Social infrastructure for Older Adults using the Multiple Decrements Approach

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The purpose of the research: The paper is based on our experiences in dealing with the elderly and a survey conducted in years 2014-2018 on what type of care and what living conditions the present and future LTC clients require, after the significant decline of their functional capacities. We assumed that the wishes of the LTC clients are in great contradiction with the EUROBAROMETER 283 report which states that 90% of elderly in all EU Member States want to have home care services to death. But we hypothesized that more than 50% of the population has no experiences what it means to be dependent on the help of others and therefore should not influence the policies which are directed from the conclusions of EUROBAROMETER. We assumed that the sampling was wrong because among the answers have also been many of those who have no experiences with eldercare. The correct answer to this question is crucial for all EU Member States, since these conclusions, the guidelines on the development of community care and de-institutionalization have been proposed to the Member States. Methods and results: We conducted the two-phase survey: first among those in four Slovenian municipalities who were included in the municipal program of homecare and nursing homes (198 answers in the sample) in 2014-2015, and second in 2018 (502 answers in the sample) among the general population in one of these municipalities. (1) We asked those who already need LTC at home or at a nursing home, where they want to live when they are not able to stay safely in their existing home due to their functional decline. Based on a z+4 test of the structure of these wishes, the probabilities of transitions and classification on the LOSS dependency scale have been developed. (2) In the second phase we also proved that in the communities like the one being under research in the second phase, more than 50% of participants in the survey do not have any knowledge or experience of long-term care. Based on these outcomes we have developed the optimal guidelines for local communities that want to adopt the social infrastructure to the wishes and needs of the elderly. We have found that the intentions of these older adults who are involved in our sample are in great contradiction with the claims of EUROBAROMETER. It is not true that most older adults want to be at their old home if they reach a state when they can no longer take care of themselves, while a lower percentage of them still believe that they will be able to stay in home care to death. When approaching or already reaching such a state of decline that to stay at home is not possible for them, they want a different, more intensive care, either in communities or sheltered dwellings, in the worst case scenario and very rarely also in institutional care at a nursing home. Discussion and conclusion: The EUROBAROMETER which was later summarized by the European Commission with its proposals on the de-institutionalization of long-term care, was based on a survey including those who are not able to imagine barriers on built-up areas. From our experience at the workplace and on z+4 test based on our field surveys, we concluded that a large part of the elderly, when they can no longer take care of themselves in their own home, wants community care that is not developed in Slovenia yet. Slovenian municipalities are not professionally prepared, while Slovenia as a whole has no any developed schemes that include risk management mechanisms, needed for European financing with the low-interest rate.

**Keywords:** Long-term care, Residential care, Retirement communities, Demography, Aging

### 13.7. Social infrastructure in the Spatial Planning of Slovenia

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Social infrastructure should be designed to meet peoples' needs from their childhood till their time of being dependent on the help of others. This requirement is integral to the planning and creation of lifetime neighborhoods. This infrastructure should include provision for many different kinds of services like those for health and long-term care, green infrastructure, kindergartens and education, community buildings, cultural and recreation areas and churches, and many other services to meet other local needs that glue communities and contribute to better quality of life. Like all across Europe, also Slovenian communities need to respond to the unprecedented growth among their seniors and a decreasing percentage of the working age population and children. The consequences of societal aging which already have a significant impact on all domains of life influence also the requirements to intensify the dynamics of constructing social infrastructure and to put new norms and standards for availability of social infrastructure in the spatial documents. The recent evidence suggests that communities are not prepared to respond to the fast-growing percentage of older cohorts in the Slovenian population and especially do not have the mechanisms to include the forecasted structure in the spatial norms of land use when the norms and standards for the social infrastructure are considered. In the first chapter, we are presenting the general definitions and consideration of social infrastructure in some European documents. Following these definitions and norms, in the second chapter, we are giving the overview of all legal documents which are considering the social infrastructure in Slovenia. We are studying what is well defined in the documents and what is missing. In a special chapter, we shall talk about coding in the Register of buildings (GURS, Šifranti registra nepremičnin in katastra stavb, 2013). Furthermore, we are considering how the norms and standards are tied to the phenomenon of the ageing population and suggest how to change it to improve the social infrastructure in the communities. The solutions advised in the paper will help to bind communities together through the promotion of social interaction, enabling them to lead more healthy and active lives.

**Keywords:** Social infrastructure, Spatial planning, Building register, Ageing population

# 14. Sustainability

#### 14.1. “Bicycle effect” on reducing enormous gas emissions in Prishtina

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The capital city of Kosovo, Prishtina, has gone through some drastic changes over the year aiming to create a new sustainable living zone for its citizens. Dense traffic, large number of vehicles, inefficient system of traffic lights and air pollution are some of the indicators which leads to a major disaster in the field of sustainable living in Prishtina. And that is another reason why Prishtina is in a pursuit of a sustainable transport system and it will be one of the greatest challenges to ever achieve. One of the fundamental elements which would enhance the sustainable transport system is a bicycle, which can also be called “zero emission” vehicle. What Prishtina should really try to seek right now is the “bicycle effect”. Not statistically significant, but the gas emissions have been increased through years and following up with the increasing number of vehicles in the city, we can conclude that Prishtina needs a new sustainable transport method. Creating cycling lines should be a major move, considering that economic, social and environment cycles could become meaningful towards sustainability. Following up the movement in the past from Copenhagen and Amsterdam to create the “bicycle system”, Prishtina has the managing potential to get the same attention and be called a “bicycle-friendly city”. Including the municipality of Prishtina and Environmental and Spatial Planning institutions, today can be the right time to invest in this transport system because there can not be no valid plans for the future if we do not have the capacity to think for living in the present. Facing the present for a better future, can make a huge difference in sustainable living and Prishtina has already the potential to aim the best for its citizens.

**Keywords:** Bicycle effect, Gas emissions, Urban design, Sustainable urbanism, Sustainable living

## **14.2. The role and the importance of the economic impact, institutional legislation for the increasing the value of the sustainability refurbishment of the building stock in Kosovo**

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Abstract of this paper is based on the relevant facts which are the key factors for increase the economic range in the Building trade market and Real estate sector in Kosovo which is depend and connect with Laws and dispositions rules from the European Union in Energy sector. The paper discusses about the increasing quality of living approach in Kosovo, in accordance with Sustainable Refurbishment of Building stock. Economic value performance for this buildings ,complete the financial analyses and directly institutional Sustainability Energy Efficiency in Republic of Kosovo with European Energy legislation, were are based on the Draft proposal of Energy Strategy 2016-2026(MED - Ministry of Economic Development,2014).The MED is the Ministry which is responsibility for the strategic document compiled and gets form, addresses to the above ministry's in Republic of Kosovo. In this study we use actually legislation which is approved from Parliament of Kosovo since 2010 and the improved beings from 2011. With this study we accepted to have more employments in this sector real estate, and to increase Economic sustainability in Kosovo.

**Keywords:** Economic sustainability, Legislation, Economic impact, Energy efficiency, Energy strategy 2016-2017, Financial and economic indicators (NPV, IRR, PBP), EE measures.

### 14.3. Process Management Improvement concerning Sustainability projects

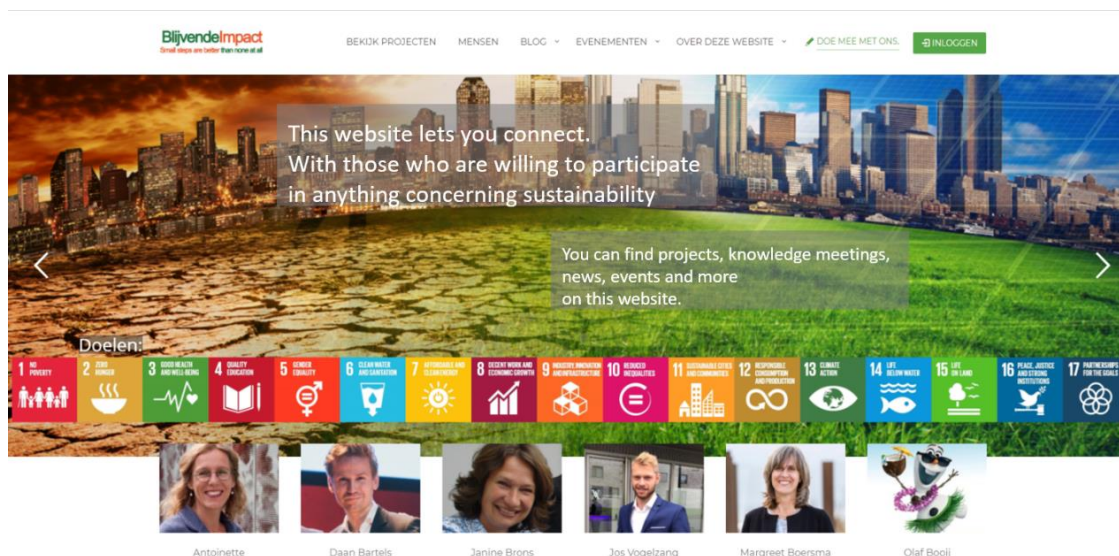
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The worldwide focus on sustainability is increasing. Research projects are becoming more and more focused on decreasing disadvantages for future generations. Within the Hanze University initiators of research tend to largely recruit students through contacting teachers of certain educations. This way of recruiting brings two negative aspects: (1) time consuming for teachers; (2) recruitment is only possible for students within the education. Research on sustainable topics contain inter-disciplinary problems and could benefit from participants following different educations. The main goal of this research is creating an efficient way of relieving recruitment tasks from teachers and creating a place where all students of the Hanze University can find research projects concerning sustainability. . The function on this website exist out of four main elements focused around the seventeen sustainable goals of the United Nations (2017): (1) placing projects/research possibilities; (2) finding projects/research possibilities; (3) sharing knowledge; (4) receiving knowledge. Currently the website's promotion is halted due to European privacy law, solutions are being sought.

Figure 1: Example website [www.blijvendeimpact.nl](http://www.blijvendeimpact.nl) (partly translated)



**Keywords:** Sustainability, Stakeholders, Process management improvement

#### 14.4. Social indicators for sustainable communities

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**Purpose:** Social indicators for sustainable communities are important to identify suitable strategies for developing an area and to reflect on progress. One of the best-known ways of assessing sustainability approaches for communities in the built environment is BREEAM Communities. However, BREEAM Communities provides a criteria and not indicators. It is important in city areas that communities provide input on the development of their area. At the same time, the uniqueness of their requirements can be many and difficult to measure for monitoring purposes in comparison with regional and national levels. The use of expert knowledge and methods can link the wider strategies coming from municipalities with the local community level with the potential of developing indicators to be measure against other city and regional areas. **Design/methodology/approach:** The key performance indicators (KPI) are designed based on a literature review from the fields of facility management and urban design. **Findings:** The KPI are presented from holistic design approach to see them as a tool under the non-technical drivers of architectural value, stakeholder awareness and behavior, economic and ownership structures and legislation governance. These drivers are not in isolation of each other as one driver often influences the outcomes of another. Some of indicators are discussed as the one, which impact the sustainable interventions on the area welfare, the changes in behavior in the area for sustainable use of the buildings, or changes in behavior based on physical changes of the area. The combination of expert-led and community-based approaches facilitates the potential for both grass root origins and scientific rigor in developing social sustainable indicators, which links, to the wider context of city and region. **Research limitations/implications:** **Originality/value:** The value is to see the benefits of social indicators to raise the awareness of the sustainability in the area and to activate the positive people behavior toward it.

**Keywords:** Sustainability, Urban area, KPI, Community participation



### 14.5. Public value orientation to urban development

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**Purpose:** The paper discuss the importance of participation of all people in the future design of an urban area through the sharing value models. It is seen that sharing value models makes it easy for the public to accept the design intentions of design planners and governments, and also to close relationship with social stability, economic development and people happiness index. The social governance will more open and more rich and meaningful intelligence can be collected, which may reduce the burden on planners. **Design/methodology/approach:** An extended literature review is prepared on the topics of community participation in design, urban development, sustainable planning and sharing value models. Establish database including issues such as the climate , economic and social benefits, and public administration in cities, set up intelligent assessment system based on AHP analysis,design a human-computer interaction model. **Findings:** Understanding the strength and involvement of community participation for the creation of the sustainable cities gives the ideas how to prepare better solutions to mobilize broader variety of urban stakeholders and to attract the users to change their behavior. Furthermore, participants with different cultural backgrounds can make urban planning integrate many factors such as ecological environment, economic development and social benefits, which are more in line with the complexity of urban development. Finally, most stakeholders benefit from shared value. **Research limitations/implications:** /For the public, they have more voices in the public affairs of urban development. For developers, residential or other products are more recognized and then the economic benefits will increase. For the government, it is possible to maximize the economic, social and environmental opportunities. **Originality/value:** The value is to find the key factors for the sustainable urban behavior and balance the value orientation of all parties , then create more open, wealthy and healthy urban areas.

**Keywords:** Community participation, Urban development, Sustainability

## 14.6. Local homebuyers in the Groningen earthquake region

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The earthquakes after the natural gas extraction in the Groningen region of the Netherlands have a significant impact on the housing market and sustainability of the communities. Since the strongest earthquake around the community of Huizinge in August 2012, with a magnitude of 3.6 on the Richter scale, it became clear there is a relation between natural gas extraction and earthquakes due to soil subsidence. As a consequence houses in the region get damaged and after research it is obvious that housing prices decline and the region might become unattractive to potential buyers of houses. Therefore the Dutch Petroleum Company (NAM) since April 29th 2014 offers a compensation for the loss of the housing price to property owners who want to sell their home. Since the compensation has been introduced, the number of participants of the regulation is lacking behind the actual sales of houses. Our study aims to contribute to the research on the consequences of earthquakes by natural gas mining on the real estate market in the Groningen region. First of all we want to declare why relatively a large part of the property owners (about 60% until 2015) don't request for the compensation regulation. Our second question concerns the buyers of the (damaged) houses in the earthquake area. Who are these buyers? Why would they buy a home in a region full of risks? We use a mixed-method approach for data collection which leads to an analysis of a unique dataset on notarial deeds of house sales in nine municipalities in the Groningen earthquake region according to The Land Registry of the Netherlands during the period 2013 until 2015 as well as discovering common patterns of interview results with residents and experts. First results show the majority of the homebuyers originate from the local earthquake area in the Province of Groningen. Reasons why property sellers after the house sale don't opt for the compensation regulation concerns the complexity of the regulation, the used valuation model and the expected long control time afterwards. We conclude the Groningen earthquake region still has it's attractiveness for local residents and buyers. Otherwise the regulation for compensation doesn't reach enough property sellers in the Groningen earthquake region. Advise to the Dutch government should be to generously compensate the residents of the Groningen earthquake regions for the loss of the value of their dwellings, damaged or not. This will help to improve the regional development and attractiveness of areas that are effected by earthquakes.

**Keywords:** Groningen earthquake region, Residential damage, Homebuyers, Compensation regulation

#### 14.7. Program Hybrid as a Model of Sustainable Preservation

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In the debate on the sustainable protection of the city, the idea of constructing "a city over the city" is the basis of all urban interventions today. In this context, interventions on architectural heritage are an integral principle of urban projects. Transformations are a compromise between preserving existing ones and creating new forms, a compromise that adheres professionalism and the wider public of the users. The transformation is in correlation with the change of social reality. When existing typologies lose their primary meaning, they are getting transformed (case of conversion of objects). In this process, the form-function relationship is abandoned and it enters an architectural research in the field of transformative typologies that would respond to the contemporary human needs. The transformation influenced by the changing social conditions is imminent. Hence, the architectural research in the field of programmatically integrated objects represents the concept of program and space transcription of conventional modernist paradigms expressed through appropriate typologies. The prefix "trans" is justified by its orientation to the future, as it linguistically shows the terms that are compiled (transmuted, transfigured, transformed, etc.). The new programmatically integrated architectural concept through disparate programs should achieve a formal transcription of modernist auto-poiesis and achieve social cohesion of different types of users.

**Keywords:** Sustainable protection, Transformative typologies, Auto-poiesis

#### **14.8. An Innovative Protocol to Assess and Promote Sustainability in Responsible Communities**

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Cities need to develop appropriate, complex and integrated solutions to address problems posed by new challenges. Smarter and more resilient cities can be developed solely through methodologies and technologies that enhance facilities and infrastructures in order to improve the urban environment and the quality of life of residents. More than anywhere else, the trends and aspirations of a changing society are emerging at universities. Thus, as “cities within the city” or as “urban mending”, universities can play an important role in directing development towards the three pillars of sustainability, by implementing the sustainability perspective in all its missions and in dissemination activities, involving the entire university and city community. This paper presents research developing an innovative protocol with a dual structure, to evaluate the sustainability level of Italian universities, by applying a system of indicators to assess it from environmental, social, academic and economic viewpoints. This method starts from an analysis of the most important protocols of sustainability certification applied in the building and university sector, and of virtuous national and international case studies representing sustainability best practices. The innovative feature is the simultaneous analysis and assessment of both objective and subjective aspects. The protocol defined for Italian universities can be applied methodologically in different environments, as the Balkan one, simply by structuring its indicators differently. The protocol has been applied in some significant university case studies with the aim of developing actions to meet users’ needs, enable sustainable management, and thereby reduce consumption and impacts, driving an increase in awareness and a change in behaviours by involving the community.

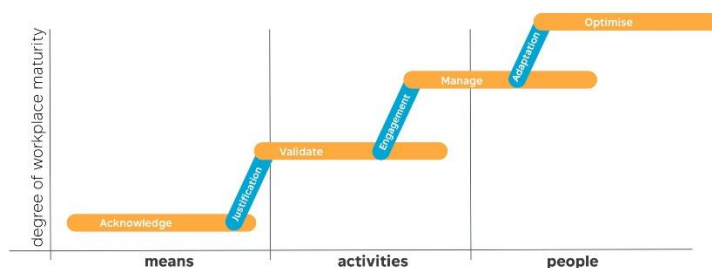
**Keywords:** Innovative methods, Sustainability, User needs, University, Assessment tool

# 15. Workspace

### 15.1. Workplace Maturity Model© Quantifying the degree of workplace growth.

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Success in the (digital) era depends on transforming how work is done to create effective workplaces and improve employee experience and satisfaction. However, it can be questioned how successful most companies are at improving their workplaces. The Workplace Maturity Model© is a new and innovative method that helps organisations gradually improve the workplace. It does so by providing metrical insights to improve the workplace to match organisational resources and goals, which ultimately leads to satisfied and more productive employees. The model has been developed in-house by Measuremen and gives unique insights into the usage and possibilities of office space across all industries. The term "Workplace Maturity" relates to the degree of workplace growth, from costs efficiency, to activity based working, and finally organisational fit. Each level of maturity has its own set of KPI's to steer and control a growing and improving workplace strategy. The Workplace Maturity Model© is supported by measurement data of over 500.000 unique workstations and meeting facilities. The model helps support implementation of Activity Based Working and relates to personal characteristics, functional needs and individual preferences. As such, it enables facility, human resources and real estate managers alongside professionals in other fields, to make data-driven decisions and elevate workplace knowledge towards a higher standard.



Key takeaways: Attendees will be introduced to the Workplace Maturity Model©, which will give facility-, real estate- and human resource managers the tools to justify the investment in information management. Attendees will learn about the different metrics that are of importance in each level of Workplace Maturity and their respective methods of measuring: asset inventories, occupancy rates, activity analyses, individual employee preferences. How to interpret this data based on a best practice, case-based educational and corporate example. Following the presentation an interactive session can be used to answer questions regarding the model or discussing the implications for individual cases. Subject Area: The presentation sheds a light on successful workplace strategy. This can positively impact the cost of office space, employee productivity, employee satisfaction and talent attraction and retention. As such, the presentation is highly interesting for a diverse public.

## 15.2. Physical and psychological approaches that improve workplace health

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**Purpose:** Since today's lifestyle requests a greater commitment to work, it is necessary to develop a healthy workplace environment in which individuals will feel satisfied and fulfilled. Stress related problems in the working population are a growing concern, since they are associated with many physical and psychological disorders. Workplace conditions play a crucial role in preserving workers mental and physical health. Negative environmental conditions, such as poor indoor air quality, inappropriate thermal conditions, crowded feeling, lack of natural light, poor ergonomics or workplace safety and others as well as the exposure to negative psychological situations, such as bullying, fear from job loss, psychological harassment, low social support and others, can have a significant influence on the stress level and consequently on health and well-being. There are different approaches that can be used to minimise the job-related stress level and improve the quality of life. **Design:** The present research focuses on the literature review analysis of specific elements of the work environment and behavioural habits of employees at their jobs with the aim to discover the characteristics of the workplace that have beneficial effects on the individual. **Findings:** Results show, that different workspace factors have an impact on the satisfaction of employees and consequently on their health. **Practical implications:** The research covers a growing need for the focus on health and well-being issues. **Originality/ value of paper:** Implementing better workplace condition aspects will introduce better base for a value for the employees and employers.

**Keywords:** Stress, Occupational health, Workplace, Work environment