



# **R&D workshop by the Department of Information Technologies CULS Prague at Vseradice 2018**

**Proceedings of abstracts**

**Vseradice, 1 March 2018**

The book of proceedings contains abstracts of presentations made at the R&D workshop organised by the Department of Information Technologies Czech University of Life Sciences Prague on 1 March 2018 in Vseradice. The presented abstracts are part of diploma theses that were defended and published in line with the §35 of the Act No. 111/1998 Coll. on Higher Education Institutions and on Amendment to Other Acts and in compliance with the Rector's Decree no. 3/2014.

Workshop organisation matches the definition of the result "W – workshop organisation" as described in the Appendix no. 4 (Definitions of the result types) of the Methodology of evaluation of research organizations and programs of purposeful support of research, development and innovation approved by the Czech government resolution on 8 February 2017 no. 107.

The abstract authors are listed in the following order: thesis supervisor, master's student.

Sborník obsahuje abstrakty příspěvků prezentovaných v rámci Vědecko-výzkumného workshopu Katedry informačních technologií ČZU v Praze, který se uskutečnil 1. března 2018 ve Všeradicích. Uvedené abstrakty jsou součástí obhájených diplomových prací, které byly zveřejněny v souladu s §35 zákona o vysokých školách č. 121/2000 Sb. a Směrnicí rektora č. 3/2014 Ochrana duševního vlastnictví na ČZU v Praze.

Uspořádání workshopu odpovídá definici výsledku „W – uspořádání workshopu“ uvedené v samostatné příloze č. 4 (Definice druhů výsledků) Metodiky hodnocení výzkumných organizací a programů účelové podpory výzkumu, vývoje a inovací schválené usnesením vlády ČR ze dne 8. února 2017 č. 107.

Autorský kolektiv abstraktů je uváděn v pořadí: vedoucí závěrečné práce, posluchač navazujícího magisterského studia.

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## **E-government in agriculture**

**Miloš Ulman, Meisaa Abu Zulufová**

**Keywords:** eGovernment, public administration, agriculture, European Union

**Abstract:** The eGovernment diploma thesis in agriculture is divided into two parts. The theoretical part is focused on the approach to the issue of public administration and its division. Further, the theoretical part explains the important concepts in eGovernment in the Czech Republic and the distribution of electronic services for the public and for natural and legal entrepreneurs. In the thesis the analysis of Czech agriculture is outlined together with the distribution and share of the soil fund. Moreover, there is also a focus on economic factors in agriculture and their development in recent years. The last part of the literature reviews is dedicated to the Ministry of Agriculture and the Farmer's Portal. In the practical part there is an overview of all electronic services that can be used in the agricultural sector. The thesis presents a case study of a farm which is based in the Central Bohemian region and is in plant production. Based on the information from the case study, a SWOT analysis is developed to identify strengths and weaknesses, opportunities and threats in the eGovernment sector in agriculture. From all the information obtained from the theoretical and practical part, the concept of the development of Czech eGovernment in the field of agriculture is proposed.

## **ERP solution for small and medium business**

**Edita Šilerová, Milena Adámková**

**Keywords:** Information system, implementation, business processes, project, ERP

**Abstract:** This study is literalt research describing choice of ERP system in small and medium bussines and its consequent implementation.

Firt part of this work focuses at theoretical description of terms in information systems area like ERP, implementation project, choice of suitable ERP, implementation of ERP and mainly critical factors related to implementation in real practice.

Second part describes particular implementation process in medium sized bakery. The main target is coverage of all economic, business and production processes in all phases of implemetation project.

## **Internet marketing**

**Pavel Šimek, Ilona Bartošová**

**Keywords:** ppc, online advertising, seo, sem, adwords, online marketing, google, email marketing, digital marketing

**Abstract:** The subject of the “Internet marketing” diploma thesis is analysis and comparison of contemporary methods of the internet marketing. Methods which have been chosen from the internet marketing field are applied in practical part on the real company. Due to analysing the default situation of the company, the strategic plan is created with the goal of increasing the awareness in the target group and increasing the number of orders through the highest possible position in search engine results. Specific procedures for better communication through online media and improvement of the web presentation are created. Those procedures relate to technical features and content elements of communication. Part of the strategy is the designed

PPC campaign, which was applied in the company and in this thesis, was critically evaluated. Online tools and software are used for website analysis, keyword analysis, online advertisement, social networks for business and monitoring activities.

## **Creation, monitoring and evaluation of online advertising campaign**

**Alexandr Vasilenko, Roman Beránek**

**Keywords:** online advertising campaign, content marketing, SEO, Google Analytics

**Abstract:** The first part of diploma thesis is aimed on the issue around marketing communication and her processes. Further the dissertation describes the importance of online marketing and related tools with more detailed description of the Google Analytics web analytics service.

The second part of this work is practical part which describing the benefit of the Internet threats video campaign setting, its analysis and the overall evaluation of the investments which were invested. A partial goal of the work is to evaluate selected short-term campaigns on the Twitter social network which promote antivirus protection product for Android - ESET Mobile Security.

For creation and track the campaigns were used these tools: Adobe Photoshop CS 6, Twitter Ads Manager, Facebook Ad Manager, Hotjar and Google Analytics.

## **Social Network Analysis in Public Administration**

**Václav Lohr, Jana Bezděková**

**Keywords:** social media, social networks, public administration, communication, news feed, village, office, Facebook, Twitter, Google+, YouTube, Instagram, LinkedIn

**Abstract:** This diploma thesis pursues the issue of using social networks in public administration. The theoretical part defines the basic terms of communication, the division of individual social networks and social media. Firstly, the historical development of social networks around the world is described and the individual social networks are characterized in terms of their functions, possibilities of utilization, comparison between themselves. At the same time, the uniqueness of social networks is defined, what they mean in the context of practical use. An integral part is the identification of communication risks in social networking environments.

The practical part includes the observation of the ten largest cities in the Czech Republic and their activity on social networks. Furthermore, a questionnaire survey is carried out, which is carried out among the users of social networks, both among citizens of the Czech Republic and among representatives of municipalities. The aim is to identify the current behavior of social network users by citizens and to identify the needs of municipalities. This research is complemented by a multi-criteria analysis that compares 10 selected criteria for social networks Facebook, Twitter, Instagram and Google+ to recommend the most appropriate social networks for use in public administration. Subsequently, the possibilities of using social networks in public administration and the creation of a model solution for the selected municipality, including the implementation of the chosen solution, are defined.

## Active Directory in modern IT

Jiří Vaněk, Jan Bílek

**Keywords:** Active Directory, Cloud, Single Sign On

**Abstract:** Active Directory in modern IT thesis describes Active Directory directory service from Microsoft company and its current development in area of cloud services. Goal of this thesis is not to generally describe cloud services from wide point of view, but describes only components regarding directory services - Active Directory. These components are however corner stones of most of cloud services as they are often using Active Directory as a service providing authentication, authorization and Single Sign on functionality.

Active Directory directory service, however it was introduced in 1999, is based on technology from early 1970s and was not basically intended to be used in internet environment. Trend in modern IT however is, to use cloud IT services and Active Directory had to be adjusted so it can be used in this environment.

Practical part of this thesis describes using Active Directory in real world scenario – using on-premise Active Directory service to authenticate cloud services.

## Mind maps in project management

Petr Benda, Martina Borkovcová

**Keywords:** project manager, project management office, legislation, protection of personal data, project management, GDPR, project, project phase, mind map, project management tools

**Abstract:** This diploma thesis is focused on the mind maps and their use in the project management. First part of this diploma thesis is based on the theoretical basis for an analytical part, especially from the field of project management, mind mapping and legislative concepts related to a project in the analytical part of the diploma thesis. In the theoretical part of the diploma thesis are described principles of the project management and principles of the mind maps creation. The practical part is based on the real project. Mind maps are used during the project realization. Mind maps are used in each project phase, for assembly the project documentation, for writing the meeting minutes, for the operational activities. Mind maps are compared with the other project management tools.

## Software to aid teaching of object oriented programming

Martin Havránek, Pavel Bory

**Keywords:** Java, Ruby, JRuby, JavaFX, JUnit, programming, teaching of programming, object oriented programming, software design, software implementation

**Abstract:** This thesis addresses design and development of the application to aid teaching of object oriented programming. In the thesis's practical part the prototype of the application will be implemented. The application will display a configurable grid containing an image representing the actor of the simulation, that could be programmed by the user. The actor will be able to move within the grid and interact with other objects represented by images, that will be arranged in the grid. Key technologies selected for the implementation of the application are the Java programming language, the GUI framework JavaFX, the Ruby programming language and JRuby, that is the technology for Java and Ruby integration. In the thesis, the log4j for logging and JUnit for unit tests implementation are used. These technologies are

analyzed in the theoretical part of the thesis and the appropriate strategy for Java and Ruby is chosen. In the initial part of the practical part, the functional and nonfunctional requirements for the application's prototype are defined. Then the user interface is designed, the application's architecture is designed as well as the most important classes for the application's prototype. After the design, the application's prototype is implemented, documented and tested manually as well as by the unit tests. The thesis also contains an example of the usage of the prototype in the teaching of object oriented programming.

## **Creation of application for electronic records of sales (EET), focusing on stall sale**

**Petr Benda, Jan Brus**

**Keywords:** electronic sales records, EET, mobile applications, Java, Android, PHP, Web API, MySQL, xml messages, portable printer

**Abstract:** The aim of the thesis is to create an application for electronic sales records. This is an app containing two main parts. The first part is the web interface through which the application can be set up and the database keeps all the necessary data. The second part is a mobile application that serves shop assistants / cashier users to create receipts and send data messages to the Financial Administration of the Czech Republic. In communicating with the state administration it was necessary to comply with the legislative requirements of the protocol. In order to create a final product that could be published, it was necessary to evaluate the current market with similar solutions and the current possibilities of technologies to create this application.

## **PPC advertising campaign**

**Václav Lohr, Dominika Bukovská**

**Keywords:** Internet advertising, Pay-per-click, PPC advertising, Google AdWords, Sklik, Google Analytics

**Abstract:** This thesis deals with the creation of paid advertising in the search and content networks and its effectiveness for the chosen trading company. The thesis is divided into theoretical and practical part.

The theoretical part of the work in which the literary research of the available resources is carried out is devoted to the field of internet marketing and Internet advertising as a necessary part of the promotion of almost every company at present. Considerable attention is focused on a set of rules for the successful creation of PPC advertising campaigns.

The objective of the practical part is to create a PPC campaign for a specific e-shop, both text and product ads in AdWords and Sklik systems, analyze the advertisement forms used by the company before the PPC campaign is launched and evaluate performance metrics in both phases. The result is the evaluation of whether or not the company benefited from the PPC advertising campaigns and prospective recommendations for performance.

## **Android application - theory and practice**

**Petr Benda, Radim Bureš**

**Keywords:** first aid log, Android Studio, XML, SQLite, Android, Google Play, Java

**Abstract:** This diploma thesis aims to introduce development of mobile applications for operating system Android. Demonstrate the procedure of developing Android application from design and realization to publishing to Google Play store. Application name is First Aid Log and it is application focused on volunteer medics. At the moment they have legal obligation to keep records about their medical operations but it's not defined how exactly. It's mostly in form of common notebook where they keep their records. Goal of my application is to simplify whole process and make it possible via mobile phone. For the development of the application will be used the Android Studio development environment and the GitHub release system.

## Business Intelligence focused on mobile solutions

Jan Tyrychtr, Libor Častulík

**Keywords:** Mobile Business Intelligence, BI, New trends, Innovation, Chatbot, Bot, Voice Interactions, Clever Assistants, Smart Watches

**Abstract:** This diploma thesis deals with the topic of Business Intelligence focused on mobile solutions.

The introductory part contains the objectives of the thesis and the methodology by which the goals will be achieved. The theoretical part is mostly dedicated to the proper explanation of the Business Intelligence term (BI) and the layers BI consists of.

The practical part of the diploma thesis highlights the increasing importance of mobile BI solutions and identifies new trends that have occurred recently and have determined the way mobile BI is heading. These include particularly text interactions in the form of chatbots, voice interactions represented by clever assistants and smart watches support. These trends within individual BI solutions are given into comparison based on own surveys and analysis. The diploma thesis introduces a mobile BI concept containing these new trends and implements it to the Czech environment.

## ICT and regional development

Vladimír Očenášek, Alena Faltusová Votavová

**Keywords:** public administration, regional development, municipality, town, information technology, accessibility of websites

**Abstract:** The diploma thesis deals with the ICT use in regional development focusing primarily on websites of towns and municipalities. As mentioned below, cities and municipalities are the basic force of regions even in the area of regional development. In today's developed world of IT, the websites of towns and municipalities are often the first step how to present itself not only to its citizens but also to potential visitors of the region.

The beginning of the thesis defines the basic terms such as information, communication, public administration, regional development, municipality, town, accessibility and applicability. Further, it deals with the mandatory legislation on websites of towns and municipalities and other recommended rules which are suitable for websites of towns and municipalities. It's followed by a methodology for analysis and evaluation of websites of towns and municipalities. At the same time, a survey was carried out among the citizens in one selected municipality. In conclusion, the thesis deals with the evaluation of results and subsequent final recommendations for creating good quality presentations.

# **Online Communication of Candidates for Czech President Election 2018**

**Václav Lohr, Ondřej Fátor**

**Keywords:** social networks, presidential elections, candidates, Facebook, Twitter, efficiency, DEA, statistical regression, opinion polls, PTAT, ZoomSphere

**Abstract:** The aim of this diploma thesis is to analyze the social networking strategies of presidential candidates in the 2018 Czech election. Of particular interest is the efficiency in which these candidates were able to involve their audiences in social network interactions, and to evaluate whether there is a correlation between the distribution of social networking resources and the real outcome of the election. A secondary interest lies in performing qualitative analysis of published content.

In the theoretical part of this work it is depicted the development of social networks, described tools for their analysis and charted social networks suitable for political communication. Further, this section includes the presentation of the individual presidential candidates and the elections themselves.

The practical part consists of several analyses of data obtained from social networks over a certain period. It is an analysis of the number of subscribers, number of interactions, PTATs, or qualitative analyses of the content of certain posts. Some of them have been used to calculate statistical regression or to calculate efficiency of communication using the data envelopment analysis (DEA).

The output of the work is a series of procedures that can analyze the candidates' communication in the following choices, compare the results with these choices and possibly predict their real outcome.

# **Proposal of a business mobile application for shop assistants in Russian Federation**

**Miloš Ulman, Iuliia Filatova**

**Keywords:** market research, financial plan, shop-assistants , business mobile application , Russian Federation, SWOT, PEST, marketing mix

**Abstract:** This thesis focuses on analysis the Russian mobile market and proposal of a business mobile application in this country that would be used as a helpful tool for shop-assistants in customer service due to which the shop could increase their sales proceeds.

The market research is based on the official data from the statistical sources (Statista, J'son & Partners Consulting), which helped to evaluated and analyzed the mobile application market and its prospects in Russia. It revealed that the Russian mobile market is young comparing with other countries but it shows the stable dynamics of growth that says about good perspectives for investors. The work of the business mobile application for shop-assistants is based on functions QR-code and augmented reality.

## **Employee education by e-learning**

**Petr Benda, Tat'ána Fišerová**

**Keywords:** e-learning, education, employee

**Abstract:** This diploma thesis deals with the characteristic of the importance of corporate education in the theoretical part. It describes the tasks of corporate education and the needs of employees. It defines e-learning and their types. Next is the main advantages and the disadvantages of e-learning along with the implementation process. The practical part focuses on the cost analysis of the current education system. It then analyses costs in the event of e-learning. Based on interviews with competent staff, a SWOT is created. This is analysed and the results provide information on the areas to focus on when expanding e-learning in society. The questionnaire survey among employees, which is also part of the practical part, analyses the attitude of workers and their opinion on the modern way of training in the company. The results of all analyses are processed and the company gets the answers the question whether it is profitable for the company to expand e-learning also on assembly worker and include more than legal training to e-learning.

## **Information technologies and rail transport in the region**

**Jiří Vaněk, Karel Fremund**

**Keywords:** railways, transport, infrastructure, region, IT, efficiency

**Abstract:** The object of this work is to provide an overview of the development and current state of information technology, which are used for organizing and managing rail transport. Specific parts of the railway infrastructure of the region show yet underestimated the potential of this type of transport. Then to show how the introduction of information technologies in the process of organizing and managing the railway transport has a direct impact on the economic operation of regional infrastructure.

## **Implementation measuring and visualizing wireless networks application**

**Jan Tyrychtr, Roman Fürst**

**Keywords:** mobile applications, android, wireless networks, indoor navigation, measuring, throughput

**Abstract:** This thesis summarizes issues during mobile application development for measuring and visualization wireless networks. The theoretical part is focused mainly on mobile applications development issues and wireless networks attributes. There are definitions and dividing of mobile applications, and develop technique on different mobile platforms stated in critical literary research. There are also stated and described parameters of wireless networks, especially Wi-Fi.

The practical part is focused on design and implementation of mobile application. There are summarized applications requirements, competitive analysis, and due UML language there are application behaviour descripted. There are also descripted key part of implementation in practical part include graphic illustrations.

The output is functional Android platform application prototype, which is able to measure and visualize selected wireless networks. In the next step application is tested in real environment and results are summarized in thesis conclusion.

## Analysis of Social Networks during the Recruitment Process

Václav Lohr, Pavel Gregor

**Keywords:** Facebook, campaign, the Municipal Police of the Capital City of Prague, recruitment, personalists, social networks, applicants, users, employees

**Abstract:** This diploma thesis deals with the analysis and application of social networks which contribute to attracting potential employees, especially in the efficient recruitment of new applicants to the Municipal Police of the Capital City of Prague.

This thesis has two parts - theoretical and practical. In the theoretical part, social networks are briefly analyzed in the frame of their competencies – global, European and national (the Czech Republic). Subsequently, their efficiency in the recruitment of new employees is investigated in the field of personnel management, both in the search for active candidates and in looking for passive ones. The other part is devoted to internet marketing, which also contributes to influencing potential applicants. The other and the most important part of the study analyzes the social networks which are appropriate for recruitment of new applicants in the Czech labour market. The conclusion of the thesis describes security principles in areas of social networks. The practical part analyzes the Municipal Police of the Capital City of Prague and provides a research using a questionnaire survey. The analysis deals with the structure of the organization, the process of acquiring and retaining employees and identifying the problem, which leads to a long-term lack of employees. The research is focused on mapping the efficiency of the success of social networks compared to other types of advertising campaigns and also the effectiveness of the recruitment in the Municipal Police of the Capital City of Prague. On the basis of practical part, there are recommendations proposed to help improve the situation of the Municipal Police of Prague.

## Comparison of cloud services

Jiří Vaněk, David Grunt

**Keywords:** cloud computing, cloud storage , cloud provider, analysis, certification, cloud service

**Abstract:** The aim of this diploma thesis is to outline cloud computing and to help decide which cloud provider and cloud repository are the most suitable for the given specifications. Additionally, the goal is to show the implementation of cloud storage on the server and other platforms.

The theoretical part will explain the concept of cloud computing and its basic division. This section will be mainly based on bibliographic and internet resources. Here are the issues of cloud infrastructure, certification, or cloud business model.

The practical part will analyze the situation around selected cloud infrastructure providers and repositories. The analysis will be carried out by collecting data on the individual providers, and then the selection method will be applied to these data by means of multi-criteria decision making and the best option will be outlined. Here is a practical demonstration of deploying cloud storage on different platforms.

At the end of the thesis I want to evaluate the final solution for selecting and implementing cloud storage.

## **Improvement security, usability and reliability of business network**

**Martin Havránek, Viktor Harnach**

**Keywords:** Computer Network, Security, Reliability, Usability, Router, Multiwan, VNP, Small business, Turris Omnia, Cisco Meraki

**Abstract:** The diploma thesis deals with a topic of a computer network of an existing company. The computer network has several lacks. Starting with those which limit users and their work but also those which are inconsistent with international standards. Those lacks are mainly in areas of usability, reliability and security.

The main goal of this thesis is to analyse current state, design a solution and implement improvements for existing computer network of the selected company. The solution must fulfil requirements of international standards ISO 27001 and ISO 27002.

The other goal is to describe step by step whole process of analyses selecting suitable solution and later selecting devices or services in that manner that the thesis could be used as a guidance for similar projects.

## **Web presentation development on base of OpenSource systems**

**Pavel Šimek, Ondřej Havazík**

**Keywords:** CMS, content system, Drupal, Joomla!, WordPress, system, extensions, themes

**Abstract:** The topic of this thesis is focused on the Open Source content management systems. The goal is to evaluate, on the basis of 4 aspects, which system is the most suitable in the given area and then to make a complete comparison of all selected CMS according to these individual aspects. The theoretical part deals with the problems of editing systems, their division and installation. The selected systems are:

WordPress, Drupal, and Joomla!, evaluated by advantages, disadvantages, use, and so on. The work itself deals with the analysis of the situation around selected editorial systems from the views of the templates, the extension, the UX and the load. The data obtained had to be analyzed, especially regarding the number of available extensions, the number of templates available both free of charge and commercially. It was also necessary to provide 5 test users and write test scenarios for UX tests.

In addition, test scripts for load testing of individual CMSs were implemented. The last part of the practical part deals with the creation of a template on which the web presentation will run, including the real implementation.

## **Utilization of the data information potential for the enterprise financial management**

**Vladimír Očenášek, Lenka Hošnová**

**Keywords:** Data analysis, Business intelligence, Financial management, Information, Information potential, Innovation, Information system, IT technology, Datamining, Competitiveness, Enterprise potential, Controlling processes, Data usage

**Abstract:** The author focuses on an analysis of corporate data sources, financial management and corporate processes that may have an information potential that the company has not been using in its decision-making so far, especially in terms of its financial management. The theoretical part deals with five main areas – corporate potential, corporate processes, financial management, use of data and presentation of information from the perspective of financial management.

The analytical part compares and contrasts the scope of the currently applied level of data use and proposes extension of the data use in specific areas of financial management, especially in corporate planning, measurement of financial and performance variables and evaluation of the investments necessary for development of the company. For this purpose, the author proposes new metrics, including the methodology guidelines, for quantifying these parameters based on the available data sources and subsequently using them in day-to-day operations. The author further addresses comprehensibility of the information presented, as he considers it of vital importance that the recipients understand the context, allowing them to correctly interpret financial management conclusions and ultimately to adopt competitive decisions. By way of conclusion, the author deals with evaluation of corporate management procedures in the areas of finance, operations and corporate information culture. He presents recommendations for development of, and modifications in, the established corporate practices so as to improve the corporate information environment, contributing to its openness, clarity and comprehensibility and willingness of all stakeholders to share the necessary knowledge on all levels of the company.

## Design and testing of the information system

Edita Šilerová, Monika Hyblbauerová

**Keywords:** information system, design, analysis, implementation, testing, agile development, information system life cycle

**Abstract:** The diploma thesis deals with development of “Service contract” module the existing information system of ASSA ABLOY Entrance Systems, s.r.o. The module can be used as a type of software application for every developing service division of the global Entrance Systems division ASSA ABLOY.

The theoretical part deals with the analysis of Czech and foreign secondary sources focused on methodological approaches to the development of the information system. The result of this part of the thesis is a synthesis of theoretical knowledge.

In the practical part, the development of the module into the information system is analyzed. The module's solution was tailored to the needs and requirements of the company. The parameters of the information system module are based on needs analysis. Based on this information, a detailed proposal was drawn up, followed by the development and subsequent implementation. The module was subjected to a test run with subsequent approval for commissioning. Module implementation was followed by user training and evaluation of module development goals.

## Open data for Ethiopia

Miloš Ulman, Leul Challa

**Keywords:** Open data, Open government, Right to Information, Data for development, Government data, Data portal

**Abstract:** Governments are responsible for collecting, organising and disseminating data on different aspects of their country. This data can be accessed openly by the public or through an official inquiry. There is a recent trend of more and more governments and institutions opening up their data to the public. Therefore, open government data is not just a buzz word anymore but an essential resource for creating new business values. This thesis analyses the importance of open data and its implications for development. It discusses the open data movement, how to start an open data initiative, its demand and civic engagement. Case studies from Africa have been examined to converse the impact of open data on development. The recent open data initiative by the Ethiopian government, the Ethiopian open data portal, its merits and shortcoming were studied. This thesis also provides an analysis of open data in the current context of the country including law, technology, economy, society and organisations. Furthermore, it includes the design and implementation of an open data-driven web application on food security. The implementation also shows how a new value can be added to openly accessible data sets using freely available software tools.

## Smart homes

Pavel Šimek, Pavel Chaloupka

**Keywords:** smart home, intelligent home, smart device, sensor, thermostat, monitoring, wireless

**Abstract:** This diploma thesis research the deployment and management of smart homes. There is analysis of selected solutions of smart homes in the theoretical of this thesis. The introduction of the practical part define individual criteria of systems for smart home. The most widely used open-source systems are compared based on these criteria using Saaty's and scoring method. Based on the comparison, a specific system is selected, deployed to the tested household and tested. The purpose of this diploma thesis is to achieve the deployment and the use of a smart home without the use of commercial systems.

## Open data in public administration

Miloš Ulman, Marek Juráň

**Keywords:** Open data, Public administration, Olomouc region, Secondary schools

**Abstract:** The thesis deals with open data in the public administration of the Czech Republic. It defines what open data are and what they mean in public administration. Contains an overview of the current status of publishing open data by public administrations. It summarizes the methodology of publishing open data and splitting individual roles. The thesis defines the opportunities and threats to public administration associated with publishing open data. In the practical part of the thesis it is proposed to elaborate a specific data set - the success of secondary school students in the Olomouc Region. Based on a complete and shortened version, the financial and time demands associated with publishing are examined.

## Infrastructure security and management

Martin Havránek, Shota Khosroshvili

**Keywords:** Infrastructure, Security, SIEM, Vulnerability

**Abstract:** The goal of the thesis is to ensure monitoring and security of IT infrastructure inside a company, not only from outside threats but also from inside threads, such as incorrect configuration, artificial mistakes and controlling privileged users (for example administrators). The goal will be achieved by implementing centralized SIEM and vulnerability assessment.

**Therminology:**

In theoretical part we will discuss required protocols and software needed for achieving goal, such as syslog, snmp vulnerability assessment and so on. We will also discuss software that we decide to use, their advantages and disadvantages.

In practical part we will implement free/open source applications into infrastructure, such as: splunk, openvas, etc.

## The possibility of using drones

**Jan Jarolímek, Kamil Klasna**

**Keywords:** unmanned vehicle, drone, limitations, authorization, safety, multicopter, sensor, legislation, operation zone, usability, risks

**Abstract:** This diploma thesis focuses on the possibility of using drones. The theoretical part of the thesis defines the drones, describes the main parts of the drones, divides the drones into categories and analyzes the potential of the drones. The theoretical part of the thesis also analyzes the legislative rules for the operation of drones in the Czech Republic and in the world. The practical part of this thesis strategically analyzes the potential of the drones in the departments of state administration, agriculture, logistics and leisure activities. The end of the practical part contains the final summary of this diploma thesis.

## IT infrastructure security in companies in the Czech Republic

**Jan Tyrychtr, Michal Kleinander**

**Keywords:** Informatics security, Threats, Risks, Security incident, Security policy, Computer attack

**Abstract:** This diploma thesis focuses on the issues of IT security in the enterprise environment. The first chapters describe the basic concepts for understanding IT security. There are also described types of security attacks and characterization of the attackers. The practical part was realized in two selected real companies. The companies are introduced first, then is performed security analysis based on technical norm ISO 27001. A risk analysis is then carried out to identify security vulnerabilities that could endanger the company. After defining security threats, measures are proposed to mitigate these risks. In the conclusion of the thesis is the economic evaluation of the proposed changes.

## Product photography

**Alexandr Vasilenko, Martin Kochman**

**Keywords:** Product photography, e-shop, user experience testing, A/B testing, product, quality, conversion rate, profit

**Abstract:** This thesis deals with options for use of product photography for improving product presentation in specific market segment. It focuses especially on the relation between photo quality and the ability to satisfy a customer. The requirements of traders and customers gained from many resources are defined as well. Due to experiences from previous photographing, there is also evaluation of recommended approach and technique. Chosen pictures demonstrate mistakes, that have been made by the photographer. In conclusion there is a comparison of different methods of getting product photos based on economic analysis.

## Analysis of CSS frameworks for creating responsive web design

Jan Jarolímek, Lukáš Kopecký

**Keywords:** CSS, framework, web design, web sites, multi-criteria analysis of variants, Responsive design

**Abstract:** The diploma thesis is focused on the analysis of CSS frameworks and application of the best-rated compromise software. The diploma thesis is divided into two parts. The first part is theoretical which describes the theoretical principles of CSS frameworks and multi-criteria analysis variants.

The part is called own analysis and is focused on the characteristics of CSS frameworks, especially their strengths and weaknesses. Then solver performs multi-criteria analysis of variants and comparison of systems. It is performed with methods AHP and a weighted sum. Variants are compared on the basis of the criteria size of frameworks, implementation, customization, grid system, breakpoints, navigation, responsive images, carousel, browser support and, last but not least, glyphs, specifically their number. The software, which is evaluated as the best compromise variant, is applied and used at the create of sample web site of Club C.

After the analysis are compared the results of methods AHP and weighted sum each other. Than they are compared the solver's results and results from other source.

## Web application development using NETTE Framework

Václav Lohr, Adam Kořenek

**Keywords:** PHP, Nette, Laravel, Symfony, Bootstrap, Foundation, Semantic UI, MySQL, web apps development, PostgreSQL, SQLite

**Abstract:** The aim of this thesis was to analyze PHP frameworks, front-end frameworks, relational databases, design and implementation of web application - advertising portal. This diploma thesis describes the development of web applications and focuses on the characteristics and specifics of three PHP frameworks (Nette, Laravel, Symfony), three front-end frameworks (Bootstrap, Foundation, Semantic UI) that have been described and compared on the basis of relevant criteria. The practical part of the thesis contains a selection of the appropriate framework for the implementation of the web application and describes their design, development and deployment.

## Secure data connection over an insecure public network infrastructure

Alexandr Vasilenko, Petr Kořínek

**Keywords:** Mikrotik, MTU, EOIP, 802.1Q, 802.1D, Concentrator, SLA, Cisco, Bandwidth, Encryption

**Abstract:** The focus of my work is on creating secure network communication between remote networks with the functionality of the second ISO / OSI model layer.

The theoretical part deals with the possibilities of realization solution the implementation of L2 connectivity, properties, principles and functionalities of the protocols used in the practical part. By analyzing the produced Mikrotik routers, focusing on a group suitable for encryption provides a framework for later selection of the appropriate element.

In the practical part, the design of the active elements is implemented. Subsequent measurement according to the proposed models shows the network throughput values of the test wiring. The resulting values are processed with respect to the detected MTU, firewall, HW dependencies and the version of the cryptographic router operating system.

Processing includes options for using the solution in concentrator mode and backup line. Proposal for a possible solution implementation switching the main and backup lines for remote site is able to switch without using 802.1D protocol.

## Economic evaluation and comparison of investments for two different solutions of the project migration of the client CRM database in a multinational company

Jan Tyrychtr, Lukáš Kořátko

**Keywords:** Ms SQL, Ms Dynamics, cloud computing, investment, investment project, TCO, CRM

**Abstract:** The Master thesis is primary focused on the comparison of two different migration solutions of current CRM system from economic point of view by using methodology TCO and technical point of view, included in multicriterial evaluation of the variants. First migration solution is designed as local upgrade from current MS Dynamics 2011 to MS Dynamics 2013. The Second solution is suggested to be migration into cloud server, which is located in Kingdom of Netherlands. Again the intended software is MS Dynamics CRM 2013, this time provided as a service SaaS. As additional alternatives were added following variants: MS Dynamics 365 as SaaS, MS Dynamics 2013 as PaaS and Salesforce CRM as SaaS.

## Electronic communication in health sector in the Czech Republic

Miloš Ulman, Luděk Kozák

**Keywords:** eHealth, doctor, patient, health insurance company, ePrescribing, eSicknote

**Abstract:** This diploma thesis deals with the topic of the eHealth system in the Czech Republic from the point of view of a general practitioner. At first, the thesis describes the current state of eHealth in the Czech Republic. Secondly, it explores some of the projects that have been realised so far and evaluates their positive and negative aspects. In the next part of the thesis, the relations between selected participants in health care are thoroughly analysed in the context of eHealth. Subsequently, the process of electronic communication between general practitioners, patients and other related subjects is examined. Finally, the thesis presents recommendations for each subject participating in the eHealth system. Their implementation could bring some eHealth projects in the Czech Republic to their completion.

## **Installation and secure of server services using LXC and Docker containers**

**Alexandr Vasilenko, Michal Kružík**

**Keywords:** linux, server, lxc, lxd, docker, container technologies, security, mailserver, webserve

**Abstract:** This project is based on the development and maintenance of server-side services in isolated environment for security, testing and migrating purposes. It describes LXC and Docker container technologies, their use cases, advantages and disadvantages along with their limitations.

The primary focus of this project will be the installation and configuration of server linux services, with and without containers, as well as solution comparison.

## **ICT in Education**

**Jan Jarolímek, František Kubín**

**Keywords:** Control, Financed, Project

**Abstract:** This diploma thesis deals with the implementation of multiprojects management into the conditions of ICT in education. The aim of this work is to describe the current status of project management in the ICT in education, using the process methodology and financing the purchase of ICT equipment to schools from different financial sources. The first part of the work is focused on the description and defyning the financing of the individual types of schools and the description of the project phasing. The practical part deals with the analysis of selected primary and secondary schools and issues conneckecked with ICT financing. The practical part of the work also compares the funding of individual schools and the way of gaining money for the purchase of ICT. The conclusion of the thesis is devoted to a summary of the achieved results and proposals for change which should upgrade the management and form better project financing and purchase of ICT. In conclusion, the author sets and proposals to improve the efficient financing of information and communication technologies in education.

## **Social networks and their marketing use**

**Václav Lohr, Jan Kudrna**

**Keywords:** Social Networking, Marketing, Facebook, Sharing, Social Engineering, Internet, SWOT analysis, Advertisement, Campaign, PPC

**Abstract:** This diploma thesis deals with marketing topic on social networks. At first these thesis focus on the concept of online marketing and then on social networks and their marketing use. These thesis also discuss the selection of the right marketing campaign strategy and analytical tools to measure the effectiveness of these campaigns. Other topics of theses thesis are SWOT analysis and Porter's analysis of five forces that can help in selecting a suitable campaign. The end of the theoretical part is concentrating on thet unethical ways of marketing on social networks and their tools.

The practical part of these thesis deals mainly with the facebook campaign for a selected e-shop. For this a SWOT analysis and Porter's analysis of five forces was created. Two sets of

advertisement were selected for this campaign, each lasting 3 weeks. The results were evaluated in the Facebook Insights analytics tool.

A part of the work is a research of unethical marketing ways on social networks. One of the unethical methods was used in practice, but not to that extent that any law was violated. The results were evaluated and summarized at the end of these thesis.

## **Assessment and proposal of the concept of the Czech Public Administration Portal**

**Miloš Ulman, Hana Kuklišová**

**Keywords:** eGovernment, Public Administration, Citizen's Portal, Electronic communication, data box, Czech POINT

**Abstract:** The Theme of the Thesis is the Evaluation and Design of the Concept of the Public Administration Portal. The Portal Should Serve Primarily as an Information Tool and Provide Citizens and Other Subjects with Access to Information on Public Administration. Nowadays the Particular Emphasis is Placed on the Transaction part which is Currently Underdeveloped by the Evaluated Portal (2017). The Aim of the Thesis is to Evaluate the Current State of the Portal, to Assess Similar Portals Abroad and to Compare and Build a SWOT Analysis of the Czech Portal to Suggest Possible Improvements Through the Concept for Future Years. The Goals are Achieved by the Comparison Method. The Result of the Thesis is the Suggestion how the Czech Portal Could be Improved and Better Adapted not only for the Requirements Set by the European Union but also to the Requirements of the Citizen for whom it is Mainly Intended.

## **GoPro vs. Competitors**

**Jiří Vaněk, Pavel Kural**

**Keywords:** Action cameras, GoPro, SJCAM, Xiaomi, Sony

**Abstract:** The Master's thesis on the topic "GoPro vs. Competitors" is about the most known company in the field of action cameras. GoPro company manage to dominate the market so the GoPro has become the synonymous for action camera. Currently the new competitors has appear on the market. The best known are SJCAM, Xiaomi and Sony.

The theoretical part of Master's thesis is based on a literature review. There will be discuss history of the action cameras, its evolution and specifications.

The practical part of thesis is about testing the GoPro products and comparing with competitors. Firstly, there will be selected the best action camera in this field. Secondly the evaluation criteria will be selected. To make this thesis credible, a video will be created with each selected camera in different condition (low-light, sound test, shooting under the water etc.) Then it will be edited in Sony Vegas studio to one comparison video. The comparison video will be uploaded to Youtube. Based on the practical part, GoPro products will be compared with rival products by Saaty method. Conclusion will be determined by the pros and cons of the action cameras.

## **Usage of Kotlin programming language for Android development**

**Jiří Vaněk, Petr Kuška**

**Keywords:** Java, Android, performance testing, measurement, benchmark, features, Kotlin

**Abstract:** The aim of this thesis is to evaluate JetBrains programming language Kotlin from the perspective of developing mobile applications on Android. Part of the thesis is to compare the Kotlin language with the Java programming language in terms of functionality and performance. The paper focuses mainly on the issue of performance testing. It defines test scenarios and design tools appropriate for their measurement. It implements designed tools and performs measurements. The results are then analyzed and interpreted. In addition, the thesis focuses on the current options for development of mobile Android applications and describes in detail functionality of Java and Kotlin.

## Modern Information and Communication Technologies In Management of Multinational Companies: Analysis of Videoconference

Miloš Ulman, Kseniya Kvolyek

**Keywords:** Content analysis, Multinational corporation, ICT, Videoconference, Multiple criteria decision analysis , Competitive advantage

**Abstract:** This work illustrates and discusses an impact of information and communication technologies (ICTs) in the modern world and how they are currently used in the strategic management of multinational companies. The literature review gives an overview of ICTs and specifics of running an international enterprise, as well as an in-depth description of videoconferencing (VC) solutions, applications and vendors. The practical part is primarily focused on VC as a tool for facilitating meeting and discussion processes. Firstly, associated costs and benefits of VC implementation are presented in comparison to international traveling. Secondly, several interviews are conducted and a content analysis is used to get a profound understanding of how advanced meeting planning is used by senior managers for achieving corporate goals and arranging effective team discussions. In the end, a suggestion of one of the available VC solutions is provided for the considered company.

## Network connection monitoring based on Raspberry Pi

Alexandr Vasilenko, Petr Kyselý

**Keywords:** internet speed, Raspbian, signal strength, Elasticsearch, Kibana, Logstash, ELK stack, connection monitoring, RaspberryPi

**Abstract:** The diploma thesis is focused on problematics of fluctuating Internet connection speed. Structurally, it is divided into two parts, namely an theoretical overview of the solced problem and own work. The theoretical part was further divided into 3 subchapters. The first chapter deals with Raspberry Pi 3 itself, which is used to a prototype creation. It is compared with competing devices and it characterizes the different operating systems which can be used. The second chapter is focused on the used tools, including the Bash shell, the Cron program and the Speedtest-cli script. The third subchapter deals with the other programs associated in the ELK Stack package. It includes Elasticsearch, Logstash and Kibana. The individual programs are briefly characterized and there are other official or unofficial tools for working with ELK Stack also included.

Author's own work deals with the construction of the speed measuring device itself. The first chapter deals with the installation and general configuration of the used equipment. The second chapter is dedicated to installing all ELK stack components and their configuration. Cron and

Bash Script are also used. The following chapter deals with the problematics of measuring and recording the signal quality. Obtained outputs and the results are reviewed in the Results Evaluation chapter. The chapter Summary summarizes the benefits of the work and evaluates the fulfillment of the stated goals of the work and it judges the correctness of the used methodology.

## **Web front-end from specialist view in small company**

**Edita Šilerová, Jindřich Kyler**

**Keywords:** Webdesign, front-end, web presentation, coder

**Abstract:** In the theoretical part, the knowledge from the field of web environment, technology and issues related to it was elaborated. Specifically, these are steps that need to be taken from a wire or graphic model when creating front-end web pages. At the same time, it is pointed out the advantages of teamwork, especially graphic specialists and the developer of the front-end to create backgrounds for web presentations.

Practical part is focused on real examples of frontend specialist and graphic expert. In addition, a simple presentation is created to primarily serve as the starting point for other projects and to be considered as a standard in website creation. There are also various tools for streamlining web front-end creation. From the investigated areas, a coherent procedure is created to form the frontend.

## **Software testing in development process**

**Edita Šilerová, Jakub Lakomý**

**Keywords:** testing, methodology, software, analysis, defect, development

**Abstract:** Thesis is pursuing problems of software testing during the phase of development. Main focus, in this complex process, is on the procedure of testing from the design of testing strategy point of view, concept and execution of particular tests.

Theoretical part consists of description of life cycle of software development, models and methodologies used during the production. This part of the project is focused on creating of a testing plan. It contains the description of testing techniques and individual types of tests sorted by level of development. In the next section is the summary of findings from the area of creation of testing scripts and bug tracking found on the basis of their execution.

Practical part of the concept solves testing of the particular application. On the basis of gained information from the theoretical part the plan is built and strategy of testing is defined. Available documentation for the tested functionalities form prerequisites for designing specification of use cases on the basis of which there are made concrete testing scenarios.

Testing on itself is brought into effect by designed tests, parallel to this testing there are set high risk regions of the application, which are submitted to exploratory testing. Found bugs are noted in the Trello application or reported to analytical team for reasons of securing their future repairs. In the conclusion of the thesis there is an evaluation of the achieved results and the whole outcome of the project is reviewed. It gives a list of discovered bugs together with recommended solutions.

## **Analysis and comparison of citizen portals provided by state administration and municipalities in the Czech Republic**

**Miloš Ulman, Antonín Lerek**

**Keywords:** Czech Financial Administration, ePortal of the CSSA, Public e-Submission Interface , Data Box Information System, e-government, eIDAS, eID card, e-Submission, Czech Social Security Administration, Citizen

**Abstract:** This diploma thesis is dedicated with analysis and comparison of portals at the level of state administration and self-government in the Czech Republic. In addition to the theoretical background, it focused on the analysis of five different institutions - the CSSA, the Financial Administration, the Municipal Office of Kladno and the Municipal Office of Žďár nad Sázavou. The text describes the purpose of these institutions and examines their offer of electronic services to the citizen with their office. To supplement this information, a questionnaire survey was carried out among citizens who sought answers to questions related in particular to their communication with the Office (including the electronic one), their relationship to information systems, but also how they obtain information on the provided services and means of electronic communication. In order to map the situation "from the other side", interviews with three representatives of public institutions (CSSA, OZP and the Municipal Office in Žďár nad Sázavou) were held. All participants clearly agree on the benefits of using public administration information systems, but they also mention various disadvantages or unresolved issues.

## **The farmer's portal as part of Farming Information Technology**

**Karel Kubata, Jana Machytková**

**Keywords:** Information, Information systems, Farmer's portal, LPIS soil register, Agriculture, SWOT analysis

**Abstract:** The diploma thesis is practically focused on the analysis of the use of the farmer's portal and other sectoral information sources needed by the agricultural enterprise for better use of data and information. In addition, the functionality of the farmer's portal used by the farm is analyzed. The first part of the diploma thesis deals with study and analysis of professional literary sources. There are described concepts, business informatics and what elements it contains. An integral part of the company's information technology is also external electronic internet services. The next part of the thesis analyzes and describes the state of information technologies in selected farm, its distribution on internal and external information systems and their interconnection. An important external information system for agricultural entrepreneurs is the farmer's portal, whose identification is part of another part of the work. In this part of the thesis are specified the functions of the farmer portal and its deficiencies, which are then evaluated based on the SWOT analysis. From the SWOT analyzes carried out, the farmer's portal and the farm itself are designed to enable users to simplify application work in connection with the enterprise information system.

## **Windows Server 2016 in a small company**

**Jiří Vaněk, Lukáš Málek**

**Keywords:** Microsoft, Windows Server 2016, Active Directory, LDAP, security, small company, network, Virtualization

**Abstract:** The thesis compares the Microsoft's server operating systems from their first edition, specifically their advantages in contrast with the previous ones. The most specific is the abbreviations Windows Server 2016 including new services and licence policy changes. The Summary closes with the technology of virtualisation together with its main providers. The practical part deals with the draft and realisation of a new network solution in a particular institution. The author chooses the best alternative based on three given possibilities and pricing conditions for the following five years. The part of the solution is also the readdressing of the network, creation of a wireless network with the authentication via LDAP and the using the new virtual servers. The thesis works with installations, detailed configuration of both servers, transfer of necessary data from an old domain control unit, using of network policies, security scheme through using certificates, migration, sharing of network items and servers' mutual reapplication. The conclusion is about a discussion on the meeting the targets and the author's recommendation for the improvements, followed by the dictionary of used abbreviations together with proper explanations. The annex includes the layout of the building with the placement of active items and their relevant IP addresses.

## Transmission of telemetry via IoT

**Tomáš Vokoun, Filip Malý**

**Keywords:** Transmission of telemetry via IoT, IoT, drone, Raspberry Pi, Arduino, SP Racing, Fiori, SAPUI5, cloud, telemetry, Multiwii, CleanFlight

**Abstract:** This diploma thesis deals with issues of transmission of telemetry via IoT. The work is mainly focused on transferring telemetry from the drone, use of Arduino and Raspberry Pi computers. Work continues selection of the most suitable IoT provider and creation of responsive applications.

The thesis is divided into two parts - theoretical and practical. In the theoretical part are defined the concepts related to IoT telemetry transmission and the technology for transferring telemetry from drones. The following is a presentation of the necessary terms and technologies with an explanation of the main problems. A part of the theoretical part is the description of current IoT projects and present technologies for telemetry transmission.

The practical part deals with the analysis of IoT platforms for choosing the best IoT platform with which author realized transfer telemetry from drone. Choosing is based on Saaty's and Scoring Method of Multiple-criteria decision analysis. Sap Cloud Platform was found out as the most appropriate IoT provider. The next subsection is the telemetry transmission from two independent drones with Arduino and Raspberry Pi 2 and 3. The last part of the practical part is the creation of an application for displaying telemetric data, sending request to drones and managing drone's data. Telemetry was transmitted, the drone sent GPS position, altitude, and other flight data. By the command from the application the drone sent the photo from the location and turned on the alarm.

## SEO and UX - search engine optimization and user experience

**Václav Lohr, Jiří Man**

**Keywords:** SEO, UX, search engine, optimization, user experience, usability, webdesign, keyword, site content, navigation

**Abstract:** Diploma thesis in theoretical part deals with mapping of new trends search engine optimization and use experience of web sides, bilateral feedback between these two very often isolated disciplines and of location into the whole webdesigner process. It also deals with mapping instruments and process, which can search engine optimization and user experience of web sides improve.

SEO cares to start with how visitors of web sides to get there and UX cares not to discourage and ideally to make customers of them.

Practical part of work realises analysis of actual web. With help of synthesis found out information from web and knowledge taken from mapped sources, it proposes possible solvings for improvement conditions optimization for search engine and user interface of analysed web.

## Deployment of Zabbix system

Martin Havránek, Petr Maroušek

**Keywords:** agent, Cacti, Nagios, protocol, SNMP, deployment, server, Zabbix, monitoring, monitoring system

**Abstract:** This diploma thesis deals with the issue of the local computer network monitoring. The theoretical basis analyzes the distribution of monitoring types, monitoring protocols, notification options, and specification of safety requirements for monitoring systems. Open source monitoring systems are presented and the properties they provide are described. In the practical part of the thesis, a multi-criteria analysis of variants is performed. The current status of the monitored environment in the company is analyzed and a monitoring proposal is made on the basis of the facts available. Furthermore, hardware requirements for server performance of Zabbix installation are designed. Its subsequent installation, configuration and commissioning are carried out. The monitored devices are configured, notices are set up, user graphs are created and the monitoring system outputs are displayed. The system is secured by certificates. Finally, the system update is described and discussion of the results is provided.

## ERP solutions for SMEs

Edita Šilerová, Tomáš Masár

**Keywords:** SME, Information system, ERP, Business processes, Functionalities, Helios Orange, ABRA Gen, Pohoda E1, IMES, Money S5

**Abstract:** This thesis is focused on the problematics of ERP solutions for small and medium enterprises. The theoretical part deals with theoretical solutions in this area. It draws from the relevant literature, scientific articles and internet resources and describes basic terms, life cycle of the IS, but also for example legal aspects related to introducing ERP solutions into the enterprise.

The analytical part of the thesis deals with selecting ERP solution in specific enterprise. On the basis of structured interview with a representative of a selected small enterprise, I define business processes, user demands and functionalities, which correspond with these processes. Afterwards, an analysis of possible solutions available on Czech market is conducted. The outcome of the thesis is a recommendation of a specific ERP solution for the selected enterprise on the basis of comparison of functionalities determined by business processes with modules of individual ERP solutions. In the process of selecting ERP solution, several factors that could influence the choice are evaluated. After introducing the ERP into the selected enterprise, the

business processes should become simpler and more effective. Furthermore, the analytical part also includes a summary of risks associated with implementation of ERP solution and a SWOT analysis. This thesis should serve as a background document and also as a project plan for introducing ERP solution into the enterprise.

## **Virtual currency, mining and profitability**

**Jiří Vaněk, David Mička**

**Keywords:** virtual currency, money, hashrate, cryptocurrency, hardware, hash, mining, graphics card, ASIC, profitability

**Abstract:** Thesis deals with the issue of virtual currency, its mining and measuring profitability of this mining with various hardware. First, the base concept of cryptocurrencies is explained, where there are introduced individual ideas of how the currencies work, which is crucial to understand the problematics. The history and mining hardware are dealt with as well. Practical part is focused mainly on mining of chosen cryptocurrency on both ordinary hardware, which is represented by personal computer, and on two solutions of specialized hardware. Mining is analysed from perspective of energy consumption and earnings. Results of specialized hardware mining were obtained from anonymous source. Mining on personal computer was executed with own hardware.

## **Web accessibility for users with disabilities**

**Petr Benda, Michal Milner**

**Keywords:** web accessibility, web design, blind friendly, WCAG, web design for disabled users

**Abstract:** This master thesis, entitled Web accessibility for users with disabilities, is divided into two parts:

The theoretical part, in which basic knowledge about users with disabilities is developed, individual rules and principles of methodologies for creating accessible websites, as well as findings from the point of view of accessibility audit and user accessibility tests. Furthermore, the practical part, which describes the accessibility audit and the subsequent first part of the optimization on the selected web presentation. The practical part also describes user testing that appropriately complements the accessibility audit and thus covers a complete analysis of the accessibility of the web presentation. The practical part is elaborated from the perspective of both methodologies, which are subject of comparison.

The main aim of the master thesis is the comparison of methodologies WCAG 2.0 and Czech decree No. 64/2008 Coll., on accessibility. The partial aims of the thesis are to characterize disabled users and their interactions with websites and to optimize chosen website.

## **The impact of web site design and quality on improving the competitiveness of the company**

**Edita Šilerová, Valeri Moscovciuc**

**Keywords:** online shopping, Internet, Marketing, Online, WEB, Website, Firm, Quality

**Abstract:** Nowadays internet is a must and its influence is still increasing. It is a powerful tool that allows to discover and compare products and even online shops. Online shops are being compared by users' rates, prices, delivery option etc. Today almost every company has its own web page providing basic and contact information, presenting services and products with options to order and pay.

Web presentation is an informational office, which is always opened. Its objective is to make positive impression on customers. Due to the fact, that internet shopping is getting more popular every day, there are a lot of e-Shops and options to shop. It makes customers to decide, which online shop will they choose and why. Presentation itself is a group of facts that can influence online users. All these facts together make an opinion, which can be positive or negative. To succeed presentation should contain all important factors in its best possible way. Web site and its presentation must assist in – positive first impression, interest increasing and motivating customers to walk through online shop and consider buying. It can assist only if its quality is high enough.

Present diploma thesis is based on completing two bigger parts – literature review and own research. Literature review was elaborated on the basis of scientific references from international databases like Science Direct, Scopus, Web of Knowledge and EBSCO Databases. Searching was performed on basis of key words used in marked databases. Analysed information was used as a background for practical part. It helped to identify definition of web presentation, its basic parts and elements, influence on customers and its strength. This information was used to specify the most important factors and its combination, that can be used as a template for creating a successful web presentation, which can improve firms position.

Own research was completed on basis of different methods – questionnaire method (to verify results from literature review), qualitative testing method (to rate current presentation of the selected web), quantitative methods by using SEO rate tools and Google Analytics. Results were used to have a list of important factors and identify web's shortcomings. Comparing two similar based on quantitative method showed influence of web presentation. Results showed that well developed presentation can positively influence firm's turnover, profit and competition. It makes firm stronger.

## Evaluation of effects of implemented information system

Edita Šilerová, Josef Motyčka

**Keywords:** remote meter reading, information system, evaluation of effects, HOS method, BSC

**Abstract:** This diploma thesis deals with the evaluation of the effects of the implemented information system AVE2 for the transmission of remote measurement readings in a major energy company. The primary aim of this diploma thesis is to evaluate the effects and benefits of the implemented IS in innogy a.s. Czech Republic. It is also an assessment of effectiveness by key users of this information system. Based on the results of the analysis, the weaknesses and strengths of the IS are identified and recommendations have been issued as to how the information system could be further improved. The secondary aim of the thesis is to familiarize readers with the analyzed system and to present its main functionalities.

The theoretical part introduces the theoretical foundations with particular emphasis on the metrics and methods of evaluation of the effects of the information system. The BSC method is described in detail, as well as the HOS method, which was used by the user to evaluate the information system.

The practical part introduces the AVE2 system to the readers. Thus, the BSC uses metrics to evaluate. The effectiveness of the information system by the HOS method is evaluated by key users.

Based on these results, weaknesses and strengths are described and recommendations for possible improvements to the information system are issued.

## Inovation of social network Week of Life

Václav Lohr, Michal Mrázek

**Keywords:** WOL, design, social network, User Interface, photography

**Abstract:** This dissertation focuses on creating a UI specification, which will be used to inovate a social network called „Week of life“. It's side goal is to outline a future smartphone app for iOS devices. The first part of my research is devoted to an analysis of current solutions of the most popular social networks. This research also includes a questionnaire survey that asks people which social networks they use and how do they use them. The second part concludes all the gathered theoretical facts, which are needed for development and also for testing the usability of the user interface.

In the practical part, a UI specification for web browsing is presented, together with an outline of the smartphone app. A survey is created in the following part of the dissertation. It introduces the results of users testing the newly designed user interface. At the end of the dissertation, an evaluation of all the proposals and also the results of quantitative testing are presented. I define a general process of inovating web portals based on my own analysis and research.

## The evaluation of the on-line marketing communication and strategy of a specific company

Václav Lohr, Dominika Mrázková

**Keywords:** on-line marketing,, on-line marketing communication,, PPC advertising,, website accessibility and usability,, social networks,, SEO

**Abstract:** The purpose of this diploma thesis is to evaluate the on-line marketing communication and strategy of a selected company. The thesis also aims to present recommendations and suggestions for improvements in the future. The thesis is divided into two parts – theoretical and practical.

In the introduction of the theoretical part, are defined the terms on-line marketing and on-line marketing communication. This is followed by a section covering marketing on social media and social networks. The thesis continues with the description of SEO as well as website usability, accessibility and responsiveness. In the Next section, there are introduced testing methods for assessing the present state of on-line communication tools. The following section focuses on PPC advertising and web analytics using the Google Analytics tool. The last part covers the marketing communication strategy.

The selected company is described in the introduction of the practical part. The practical part is based on quantitative and qualitative research in on-line marketing communication and strategy. The recommendations and improvement suggestions are based

on a comparison between the results of the analysis covering the present state and between the theoretical foundations supported by the latest trends in on-line marketing.

## **Analysis and selection of optimal solution of information system for elementary schools**

**Miloš Ulman, Zdeněk Nagy**

**Keywords:** school agenda, IS Bachelors, benefits IS, elementary School, public administration, communication, shortcomings IS

**Abstract:** This diploma thesis deals with information systems for primary schools. It is primarily focused on their analysis and the choice of the optimal solution for the particular school.

At first, the history of school information systems is briefly described and the overview of the systems available at the Czech market is presented. Then the issues of legal regulations, legal novelties, the system integration, the information policy and the ways of funding from the viewpoint of primary schools are shortly characterized. The principal theoretical concept for the practical part of the thesis is the presentation and explanation of the criteria list for the choice of the suitable information system for the school by Mr Neumajer.

In the practical part, the author provides the case study and the multiple-criteria decision analysis, in which two methods for the evaluating and choice of the suitable information system were used. These are the lexicographical method and the analytic hierarchy process. The criteria of the choice were ordered by the priorities and requirements of the experts from practice. By means of calculation the criteria were attached the relevant weight.

After using the tools mentioned above, the case study of the particular information system for the given primary school and for the ordering of those systems according to the weight of criteria is presented in the end of the thesis.

## **Email marketing for technology startup**

**Vladimír Očenášek, Kristýna Němcová**

**Keywords:** email marketing, startup, online marketing

**Abstract:** This diploma thesis analyzes email marketing for startups in the B2B segment. This thesis consists two parts. The first part is theoretical literary research and the second part is practical.

The theoretical part defines what email marketing is and which elements make it successful. It also describes the A/B testing method. To fully understand this topic, it is also essential to introduce the reader to the basics of internet marketing. The theoretical part also includes an explanation of the term "startup" because this thesis is supported by data from an IT startup company.

The practical part is analyzing the email marketing in a technology startup company called Avocode. This part starts with an introduction of this company with a description of how they operate. The most important part of this thesis is the analysis of email marketing for startups in the B2B segment. The goal of this thesis is to learn, how different email subjects impact the open rate metric in email marketing.

## **Design of smart home system in UML**

**Martin Havránek, Jindřich Netušil**

**Keywords:** UML, UI Specification, Information system, Smart home

**Abstract:** This master thesis deals with design of smart home system in UML. The thesis is divided into a part of literary research and part of design of smart home system. The introductory part of the literary research focuses on the problems of smart home systems and the analysis of the language of UML. The final part of the literary research is devoted to the selecting suitable software for modeling in UML and theory of information systems. The second half of the thesis focuses on the design of smart home system. This design begins with the analysis of functional requirements, the identification of use cases and continues with the creation of static and dynamic model. The designed UML model is then systematically supplemented with UI specification elements.

## **Using honeypots as part of security analysis**

**Alexandr Vasilenko, Lukáš Nikl**

**Keywords:** honeypot, Kippo, network attacks, honeynet, botnet, security measures, network security

**Abstract:** The thesis focuses on the topic of honeypots and their usage in analysing of new network threats and procedures of attacks. This thesis provides complex overview of the honeypots and systems, which honeypots are part of. The next topic, which this thesis mentions, is separation of various types of attackers and their motivation of attacking. Thesis continues with describing the most usual types of attacks and botnets, which are the source of the majority of network attacks. The last section of the theoretic part in the thesis is focusing on risks of implementation and maintenance of honeypot and the legal risks connected with it. The practical part of the thesis deals with designing and implementing of chosen honeypot solution Kippo. There are specific honeypot environment configurations shown. The next part analysis all the collected data, this data could be divided into three major categories, which are geological data, attackers input and combination of login credentials used by attackers. In the last part of the thesis there are safety recommendations in using network technologies. There recommendations are defined thanks to collected data and the theoretical part of the thesis.

## **UX for web apps**

**Petr Benda, Jakub Štěpán Novák**

**Keywords:** design, application, web, UI, user experience, UX, testing, concept, usability

**Abstract:** Diploma thesis follow up on bachelor thesis which focused on user interface of mobile devices and covers the whole field user experience in applications. Basic principles and goals during user interface creation are the same, no matter the platform, the product is being designed for. Along with short summary of basic UX techniques, this thesis will expand possibilities occurring primary within design of web applications. All of the described methods can be applied to design apps for other platforms to a certain extent.

Goal of theoretical part is to analyse and sort various methods of design, development and testing of web user interfaces. It is defined by knowledge obtained from professional literature,

experience and consultations with experts in this field. Another important step is definition of elementary crucial theoretical knowledge in the UX field and the development procedure. In practical part, all the obtained knowledge is used to model development process of user experience for web application Včelstva online, working on different user base types and perspectives. This part is completed with realization of new design for user experience including testing and final assessment.

The result is comprehensible description of design principles in form of framework, that enables faster a better development of applications, which will work perfectly in every scenario related to user experience. This is critically linked to success of every application used by human being.

## **Information system for secondary school management - a case study**

**Miloš Ulman, Klára Nováková**

**Keywords:** management of a secondary school, implementation, school information system

**Abstract:** This thesis deals with analysis and evaluation of the information system for the management of a selected secondary school. It is based on analysis of school information systems and related legislative regulations.

The research part introduces the analysis of using of the information system by a selected secondary school. The thesis also includes the summary of individual information systems and their evaluation according to the set criteria and compares possibilities of their application for the management of a secondary school.

The conclusion presents the suggestion of solution with regard to functionality, affordability, and safety of the school information system in connection with needs and characteristics of a selected secondary school.

## **Draft concept of digitizing and archiving of documents on workplace contact the Labour Office**

**Miloš Ulman, Štěpánka Nováková**

**Keywords:** The Municipality of Labour CR, state administration, archiving, information system, Labour office, digitization, legislation

**Abstract:** The graduation work deals with digitization and archiving of documents, specifically with digitization and archiving in the contact department of the work office. In the first part there are described the main demands of legislation in connection with digitization and archiving from the point of view of creating electronic documents during input and output, creating digital pictures in an electronical form. In the work there are also described the current conditions of the process of activities, documents in the main administration realized in the Municipality of work. It is checked whether the functionalities which offer administration information systems in connection with the topic of the work are used. In the second part there is proposed how to make use of these functionalities, optimization of activities with electronical forms of the documents and possible way of digitization for future.

## **Analysis of open source web content management systems**

**Miloš Ulman, Taisir Obad**

**Keywords:** CMS, Open Source, CMS Comparison, PHP, Modx, Drupal, Joomla, WordPress

**Abstract:** The diploma thesis primary objective is to analyse and evaluate of open source web content management systems (WCMSs) based on approaches of design and implementation methods. These methods were evaluated using decision making scoring (Multiple Attribute Decision Making - MADM) and criteria are chosen according to ISO/IEC 25010 quality standards and many features from the website's business perspectives. For the analysis, comparison and evaluation, four content management systems (CMSs) were chosen (Modx, Drupal, Joomla and WordPress) which are popular nowadays. Based on the research results, WordPress was indicated as the most suitable CMSs.

Partial objectives of the thesis are to compare different design approaches, implementation of web presentation using CMS and practices of manual coding. First website was built using the selected CMS and in the last sections, the second website was built by manual coding (HTML5, CSS3, JavaScript and PHP) to analyse the details and results were summarized. The website was hosted on a real domain supplied by the web hosting provider. This work covered major areas of design and implementation of web application built in CMS. The research concludes that all four CMSs are powerful tools to manage the websites. These tools have different functionalities and capabilities based on diverse scenarios which make one of these four CMS options a perfect fit for the key web functionalities.

## **UX and usability of eAGRI portal**

**Petr Benda, Antonín Omelka**

**Keywords:** UX, User Experience, usability testing, design, web, eAGRI, public administration

**Abstract:** This diploma thesis is focused on User Experience and usability problematic, especially in large size web portals. User Experience is important part of web development, but it is often overlooked. This situation is also very often connected with public administration web sites. The specific web portal which is examined in this thesis is eAGRI. Portal eAGRI is resort web site of Department of Agriculture so it is public administration web site. Main goal of the diploma thesis is to choose appropriate usability testing methods for eAGRI and perform these methods. According to testing results identify usability problems and propose suggestions of these problems. Last goal of the thesis is to generalize this practice, so it can be used for usability testing of similar web portals.

## **Managing of security in Healthcare facilities with IT technology**

**Vladimír Očenášek, Michal Opava**

**Keywords:** Security, Information Security, Cyber Security, Security Policy, ISMS, Information Technology (IT), Information System, Data, Information, Hardware, Software, Services, Critical Infrastructure, Medical devices, Legislation

**Abstract:** In practice, we come across a different concept of security that derives from the subject or object to which it is directly related. For example, population security, nuclear safety, state security, work safety, information technology security, transport safety, health and safety and many other areas. There is a separate discipline for each area.

This diploma thesis focuses on safety in medical facilities using information technology, which can be summarized in the concept of information security.

The text of the reader's work is accompanied by the introductory theory and the legislative environment that forms or changes during the creation of the work, to the actual practice and to the established facts, which the health care facility and the security, put in interesting light. The diploma thesis, by means of questionnaires, completes the author's assumption about the state of safety in health care facilities and compares the opinion of the professional public and the citizens with his own, which is based directly on personal practice. The outputs of the questionnaires are confronted with their own research in a real health facility, which was obtained through a created templates for building an asset overview in the organization and their security and management in the existing hospital infrastructure.

At the end, the current state of safety of healthcare facilities is evaluated and the recommended steps in several steps to correctly and efficiently implement security policy in the healthcare facility.

## **Creating an information system**

**Edita Šilerová, Daniel Páral**

**Keywords:** relational databases, UML, information system

**Abstract:** Information systems are nowadays increasingly needed in data processing, data storage and data evaluation. Therefore the thesis deals with enterprise information system. The aim of the thesis is to design and create an information system which will be suitable for small start-up companies. The system is designed for real company that does not want to be mentioned so it is referred to as XYZ. The thesis characterizes the company XYZ and its requirements for functionality. The system is designed in UML language and different diagrams show both the static structure and the individual operations that are taking place in the company. Next part of the thesis deals with the creation of a relational data model which will effectively store the data. In the last part of the thesis is shown the actual system. On individual modules is explained the whole functionality of the system. The system should be put into production at the beginning of July 2018.

## **Use of Social Media for Marketing and Promotion of B2C business and its effect on overall reputation in the Czech Republic**

**Petr Benda, Yuriy Partala**

**Keywords:** social media, business, company, advertising, budget, B2C, propagation, campaign, strategy

**Abstract:** The main goal of the thesis is to compare several B2C companies in the Czech Republic, determine how they use widely social media in business, and analyze their marketing campaigns. Partial goals can be characterized as follows: to analyze how these companies differ in ways of using media promotions, to determine which social media is more widely used in the Czech Republic, to ascertain which type of advertising is more popular across these companies.

The methodology of this study is based on analysis and synthesis of technical information resources dealing with selected issues. The theoretical part analyzes the literature of Czech and foreign authors. The main method of gathering information for a practical part is the visual analysis of marketing campaigns. The practical part of the diploma work is based on SWOT

analysis, benchmarking, financial analysis and regression. The last chapter of the work is a discussion chapter.

## Possibilities of utilization of the Registry of Contracts at the Ministry of Defence

Miloš Ulman, Petr Pěcha

**Keywords:** Register of Contracts, Ministry of Defense, Portal, Law, The Integrated System of the Register of Contracts, Guardian of contracts, Small-scale public procurement, Methodology

**Abstract:** The thesis deals with the Register of Contracts. It focuses on the possibilities of using the Register of Contracts in the Ministry of Defense when looking for the Open Market Value (OMV) at the time and place, and when looking for suitable entities for small-scale public procurement in the ministry. The cost-benefit analysis (CBA) of the Register of Contracts compares the convenience of the procedures when using either the conventional method or the method using the Integrated System of the Register of Contracts and the guardian of contracts portal for the small-scale public procurement.

On the basis of the findings, the methodology for working with the Register of Contracts in the Ministry of Defense Department is created. The methodology serves the authorized staff in the department to facilitate the work of small-scale public procurement.

## Cloud data storage in the elementary school conditions

Jiří Vaněk, Jiřina Pešková

**Keywords:** backup, cloud, data storage, elementary school, provider

**Abstract:** Companies as well as organizations produce daily a lot of data of various financial or non-financial value. These data should be safely stored, and backed up but at the same time be at one's disposal as quickly as possible when needed. Nowadays, we are able to store information in digital form. This diploma thesis therefore focuses in its theoretical part on the overview and characterization of different options of storing digital data with an emphasis on a current trend, which is the data storage in the cloud.

Practical part then characterizes selection of the most suitable data storage, or more precisely the best provider of this cloud service according to the customer's requirements, a small primary school, and describes in detail the process of implementing the school's transition into the cloud. A separate chapter is also dedicated to security and deals with encrypting data directly on the computer of the user.

## ENERGY SELF SUFFICIENCY ON CAMPUS

Miloš Ulman, Václav Pflanzer

**Keywords:** Micro grid, Electricity storage, Electricity storage system, Battery, Flywheel, Fixed base index, Chain index, Net Present Value, Sensitivity analysis

**Abstract:** It is the aim of Cranfield University to improve the self sufficiency of the campus energy supply. One of the ways to do so is to introduce renewable energy. These are, however, affected by intermittency in energy supplies and thus pose challenges to the grid stability.

Energy storage systems are widely recognised as one of the main ways to make renewables more reliable and also allow for peak shaving. Moreover, decreasing costs of such systems make it more attractive for those other than grid operators, such as Cranfield University. The aim of this thesis is to estimate the optimal parameters of such a solution (power and capacity), through an analysis of campus electricity consumption and afterwards to evaluate the financial feasibility for each system via net present value evaluation techniques and sensitivity analysis with different variables to determine under which conditions they are feasible. Capacity was calculated to 5 412.85kWh and power to 902.12kW. The approach showed that none of the five selected technologies were not economically feasible at given set of conditions. Conducted sensitivity analysis suggests that significant decrease of initial investment, longer payback period or increase in price of electricity make chosen technologies viable. The paper concluded that capacity and power parameters might be further used by the Facility office of Cranfield university on the field of electricity self sufficiency. It also concluded that the facility office might use its own confidential data to reach more accurate outcome.

## Functional vs object programming of web applications

Pavel Šimek, Jan Plíva

**Keywords:** programming, OOP, functional programming, object oriented programming, web application, information system, class, framework, database

**Abstract:** The thesis is consisted from two parts – theoretical and practical. In the theoretical part I will explain what the web applications are and I also mentioned their history or how they are being proposed. I also focused on technologies which are, used to create and programming web applications. In the end I will look on their security. Other chapters of theoretical part are focused on functional and object programming – their history, principles, analysis advantages or disadvantages. The final part of this part is evaluation and comparison.

The second part – practical consist of a sample of functional and objective code. I also create web application in PHP for housing cooperatives. I explain how the application works is and I show part of code. At the end we look at the technologies which is used for web app development and their future. The conclusion of the thesis is the evaluation of all results I have found during my work.

## Computer network at hotel facilities

Jiří Vaněk, Michal Plzák

**Keywords:** Computer network, Wi-Fi, PC, Restaurant, Server, Cameras, VoIP, Security

**Abstract:** This diploma thesis describes specific computer network and its requirements, which is used in a hotel. Computer networks and their definition are described at the start of the thesis, computer networks used in the past, and computer networks that we use nowadays. There are also described communication protocols, which can be used in the practical part. At the end of the theoretical part are described active and passive networking hardware, also network services, their controlling and managing.

In the practical part we can see analysis of the computer network used in hotel including all floors. New proposals of the computer network if the organisation grows, or if the organisation stays the same. There are also described requirements for the new computer network and new active/passive networking hardware, which was chosen via the multicriterial analysis. The output of this thesis is proposal for the new computer network for hotel facilities DAR, also can

be used for other companies with the same or similar size. Proposal includes financial analysis of the initial costs and the future costs.

At the end of the practical part is described how tough was the realisation and the final solution of the computer network.

## E-commerce optimization

Václav Lohr, Tomáš Pokorný

**Keywords:** usability and accessibility, CMS, e-commerce optimization, internet marketing, proces automation, data analysis

**Abstract:** This diploma thesis deals with the optimization of e-commerce. The aim of the thesis is to create a concept of optimization, which can make business processes more effective, help with creating of marketing strategy and increase the competitiveness of e-commerce. Processing of the thesis was made with the theoretical knowledge from literature, script, lectures and reliable internet resources focused on technical solutions of e-shops, internet marketing, process automation and data analysis. In the practical part is created a optimization concept with case study of application of the given concept on a real project. In conclusion, the results are summarized and its effectiveness assessed.

## Internet of Things

Vladimír Očenášek, Milan Postránecký

**Keywords:** Internet of things, IoT, smart home, internet

**Abstract:** This thesis deals with the issue of Internet of things with focus on its use in smart homes. The theoretical part explains the basic definitions of the term of internet things, describes its history, current usage, technologies and used standards and last but not least possible threats. Thesis also introduces the main providers of complex smart home solutions in Czech Republic.

The practical part is dedicated to the proposal and choice of the optimal solution of the smart home with regard to the different preferences and budgets of the potential users whose profiles were created based on the questionnaire survey. The Saaty method is used to determine the preferential weights, and the choice of the optimal solution is done by multi-criteria selection.

## Using of economic systems based on Cloud Computing in business

Jan Jarolímek, Petra Pražáková

**Keywords:** Cloud Computing, Virtualization, Economic Software, small and medium-sized enterprises, On-Premise, On-Demand, Infrastructure as a Service, Cloud Hosting, GDPR

**Abstract:** The diploma thesis deals with an issue of using Cloud Computing for installation of Economic Systems in small and medium-sized enterprises. The aim of the thesis is to define and analyse different ways of installation of Economic Software, especially the most using one in the present (so called On-Premise) and On-Demand. The theoretical part defines the basic terms associated with the researched issues and also technologies, which are used for installation of Economic Systems, such as Cloud Computing, virtualization, hosting. This part

of the thesis devotes to regulation GDPR and using of Cloud Computing by the Czech enterprises and Public Administrative Body. The practical part is based on case study, which analyses different ways of installation of Economic System in specific small enterprise. The suggestion of installation of Economic Software based on Cloud Computing and its analysis is made on the basis of analysis of the way of installation in the present. The costs on the present and suggested solution and the fulfilling the requirements of the enterprise are compared after that. The more effective solution is determined on the comparison of these two solutions and satisfaction of GDPR's requirement. The conclusion contains interpretation of results and recommendation for the enterprise just in case it will decide to implementation of the suggestion.

## GSM-R the technology in rail transport

Jiří Vaněk, David Pučálka

**Keywords:** Wireless Communication, Base transceiver station, Global System for Mobile Communications Railway, Radiostation

**Abstract:** My thesis is focused on the theme of Wireless Communication Network in the Railway Transport and provides overview about the contemporary development of these technologies. At the beginning of my thesis is mentioned the history of the GSM-R Technology and actual Wireless Networks in the Railway Transport. GSM-R System is introduced not only as new communication way in order to reach higher level of effectiveness and safety of the Railway Traffic, but also as a porter for the security system ETCS. It is also explained the necessary compatibility of GSM-R in the Railway Interoperation. In the practical part of my thesis is demonstrated the design how to cover the Railway Line according to the standards used in the Railway Infrastructure and to implement it to the current situation. All data are summed up and economically compared in the last part of my thesis.

## Evaluation of effects of implemented information system

Edita Šilerová, Jiří Pytolaj

**Keywords:** information system, implementation, effectiveness, evaluation, SAP

**Abstract:** The diploma thesis deals with the efectiveness evaluation of the implementation of the enterprise information system in the selected company. The theoretical part defines and explains the basic concepts related to the use and evaluation of the information system. It also describes the basic life cycle phases of the information system and defines the available methods for its evaluation. In the analytical part, the company TopEngine Ltd., in which the evaluation was carried out, was introduced as well as the SAP system which was implemented there. The next step is the analysis of the selected business process both before and after the implementation of the information system. The efficiency is then evaluated using selected methods. The main objective was to evaluate the benefits of SAP implementation in this company. At the conclusion of the thesis, the benefits are evaluated and the final evaluation of the case study is carried out.

## Virtual Server Provider

Alexandr Vasilenko, Jiří Rohal

**Keywords:** Virtualization, Power, Cluster, Security, Virtual Server, VMware, Cooling, Provider

**Abstract:** The thesis deals with the design of the environment for the company providing virtual servers to customers. Since server design and virtualization technology is second only to the increase in availability, a stable and secure environment is required. Therefore, the work also deals with the safety environment and the provision of means for high availability operation. Environmental security solves the division of company objects into security zones with their own rules. The high-availability service section deals with providing stable power and temperature in the server room. This is designed according to the Tier 2 standard. After providing basic resources, the thesis deals with the possibilities and in the practical part also the design of the physical infrastructure and the setting of the VMware virtual platform. Physical connection and SW cluster settings for high availability and minimization or complete elimination of service failure in the case of HW, SW or human error are addressed. The final goal of the work was to select both IT and non-IT environments, since in the event of an outage, the corresponding personnel should be immediately informed.

## Version control systems in software engineering

Miloš Ulman, Yevhenii Samoilov

**Keywords:** Source code management, version control, team development, software engineering, open-source, Integrated Development Environment, Team Foundation Server

**Abstract:** The main objective of the thesis is to perform an analysis of the existing version control systems and their role in the software development process.

Firstly, author makes a literature review on the topic of source control and gives all the necessary definitions of different mechanisms of version control software work. Then author creates a general overview of the current version control system solutions, their advantages and disadvantages.

Next, in order to analyze usage of Microsoft Team Foundation Server as a source control management tool, the case study is presented. Development environment of a Czech telecommunication software company is described and its staff's experiences with version control are evaluated.

Then, version control systems are evaluated from a perspective of corporate software development. It is shown how this type of software can contribute to the development process and how it can be used in order to achieve more than it was originally intended by its authors. This part of the research is targeted mainly to a large software development companies.

## E-commerce in Iran: A case study of Digikala

Miloš Ulman, Shadi Saremi

**Keywords:** E-commerce, Development, Internet

**Abstract:** E-commerce is still a very new concept for many people however in the information age, the conducting business activities through the internet, especially for small and medium companies that want to compete with larger companies, is an integral part of the body of the commercial activities of the organization. Small companies must be a member of e-commerce system, otherwise they will lose their ability to stay in business competition.

Electronic information exchange is one of the oldest and most fundamental defragmentation tools in business activities. Moreover, due to the consistent nature of standardization in this area, it is still one of the most useful and the most advanced tools in e-commerce applications today.

## **Analysis of communication of political parties on Facebook**

**Václav Lohr, Viktor Seige**

**Keywords:** analysis, communication, Facebook

**Abstract:** This diploma work deals with analysing the communication of eleven Czech political parties and movements on social network Facebook between June 2017 and January 2018. From the data obtained and processed were gained results which describe conclusions about how each party uses social network Facebook for being more visible, promotion and communicate with people mainly under the age of thirty. Diploma work also describes where parties have weaknesses, where they are wrong and what are their strengths as well. A summary of the theoretical and practical part of the work is formulated with some recommendations for streamlining communication and better using of Facebook by political parties in the future.

## **Internet of Things - IoT (LPWAN usage in IoT environment)**

**Jiří Vaněk, Pavel Skalický**

**Keywords:** Internet of Things, Wi-Fi, LPWAN, smarthome, security, smartcity

**Abstract:** This diploma thesis deals with the Internet of Things. The introduction to the theoretical part defines what the Internet of Things is, a brief description of what technology is being used, and shows the areas of the Internet of Things. It deals with a brief history, basic concepts and the use of communication technologies. An important topic that concerns this work is security. In the practical part, the thesis focuses on the creation of devices that fall into the category of Internet of Things. The main part of the practical part is the design of a smart home, assuming the most common components used for creating smart homes. A network is designed to work together to communicate to improve user experience. The whole study is based on full automation of a smart home. This way, the Internet of Things can affect the lives of all people. At the same time, the future of the Internet of Things is presented, what are its options for the future. This way, the Internet of Things can affect the lives of all people.

## **Securing personal data under GDPR regulations at secondary schools**

**Jan Jarolímek, Petr Skipala**

**Keywords:** GDPR, IA Security, cloud computing technology, Google Edu, Microsoft 365 office, high schools

**Abstract:** This thesis focuses on a personal data processing on the technical secondary school. The main aim of the thesis is analysing of the current condition of a personal data processing in a selected high school and suggesting of the procedural advancements which will be secure

in conformity with GDPR. In order to create a new procedure of a personal data processing, a usage of the cloud's technology is supposed.

In the theoretical part of the thesis, particular specifications of activities and fields, in according to the regulation of the European Parliament and the Council (EU) 2016/679 are defined. The processing operations the GAP analysis for a need of determination of current condition of processing and keeping a record of personal data is also defined in the thesis. This part includes a general specification of the Cloud computing and the basis of process management. The practical part is focused on processing of the GAP analysis in established areas where processing of personal data is carried out. According to evaluated data from the GAP analysis, the process diagrams are designed to clearly describe and revise all the main and support activities related to the personal data record. Evaluated areas and designed process diagrams are defined with emphasis on the possibility of using cloud technologies.

## Social media for business

Václav Lohr, Pavla Slezáková

**Keywords:** Social Media, Marketing, Marketing Communication, Content Marketing, Key Persona, Facebook, Instagram

**Abstract:** This diploma thesis focuses on the use of social media in the company. The theoretical part of the thesis is focused on the systematization of knowledge gained from professional literature, namely the concept of marketing, marketing communication and content marketing. Another issue that the theoretical part deals with is the present state of the Czech internet environment. The following chapter discusses the topic of social networks, its relevant examples and the importance of the existence of a key customer group in the communication campaign.

The main goal of the diploma thesis is a formation of a complex approach to marketing communication on social networks of the company. For this purpose, a real company was selected, which was thoroughly analyzed not only from the corporate and competitive perspectives, but also from the approach to its current usage of social media. The results of the analysis were further applied to define key persona, to set goals for social networks, and ultimately to create a specific communication strategy on social media. Based on the data found, the basic rules generally applicable to social network administrators were also created. The final draft contains a set of communication themes in three basic pillars – building of a brand image, sales promotion and customer care. At the very end, the results of proposed campaign are evaluated.

## Cloud computing - comparison of cloud storages

Jiří Vaněk, Marek Sosna

**Keywords:** PaaS, SaaS, cloud computing, cloud, data storage, file sharing, data backup, IaaS

**Abstract:** The diploma thesis is focused on cloud computing and data storage in clouds. First, theoretical points are explained. The following is a practical part where specific users are defined with their requirements and a choice of ten cloud storages. Selected cloud storages are analyzed and tested for other parts of the work. On the basis of specified criteria, all variants of cloud storage are compared using multi-criteria decisional analyzes. The best results are recommended and then analyzed in detail in terms of functionality. The last part of the thesis

deals with the creation of a simple web site, which serves as presentation of the results from the practical part.

## The Swift Programming Language

Jiří Vaněk, Marcel Soukeník

**Keywords:** Apple, Swift, Mac, Programming languages, Computer Science, Open Source

**Abstract:** This thesis topic is about The Swift programming language. The main aim of the thesis is to provide defining functionality of the Swift language and complete research about this language. Also on practical examples demonstrate syntax and use of the Swift language. The thesis has several sections. The theoretical section is to provide all information about the topic. The practical section is to show: an analysis of source code and syntax, implementation covering features of the language and comparing syntax and performance of other languages. Final section summarizes all results and observations.

## Opensource backup system analysis

Alexandr Vasilenko, Michal Strnad

**Keywords:** backup, opensource, Bacula, Bareos, BackupPC, rsync, deduplication, VTL, HSM

**Abstract:** This thesis focuses on the analysis of available opensource backup tools and systems. Attention is paid to selecting a suitable candidate meeting the defined requirements allowing to run with the hierarchical storage CESNET a.l.e. The selected solution is the opensource system Bacula. It was subsequently subjected to in-depth testing with using of a pseudo-random number generator programmed for this purpose. Based on testing was created the list of problems and deficiencies, for which were designed and developed suitable solutions.

## Testing Banking Applications

Jan Tyrychtr, Martin Šimpach

**Keywords:** BPMN, Software Development, Application Errors, Software Testing Workflow, Price Repair Error, V-Model, Testing Software, Test Methodology

**Abstract:** Testing is part of the software lifecycle, which is often underestimated. The aim of this work is to analyze the testing process across the life cycle of software development and suggest improved testing in the selected business.

The theoretical part is devoted to describing and explaining the main test process artifacts, such as testing grounds, test methods and the use of individual tests in the life cycle of the application.

In the practical part, the BPMN notation illustrates the current situation, evaluates the weaknesses of the process and suggests improvement of the process. Original state and the proposed solution has been subjected to economic analysis and estimated costs of error correction and possible savings resulting from process change.

The results of the diploma thesis were achieved by studying professional literature, economic statistics obtained from public and internal sources in the given enterprise and by analyzing the internal processes in the diploma thesis.

The results of the thesis can be used as a basis for project managers or test managers, when designing and managing an application development project.

## Use of inbound marketing for websites

Petr Benda, Václav Šlosárek

**Keywords:** Web, SEO, Inbound marketing, Personas, Mailing, Blog, CTA, Lead, Google Analytics, Conversion

**Abstract:** The thesis is thematically focused on the field of online marketing. The specific merit of this thesis is to create and implement an inbound marketing strategy for a selected web site. The subject and case study for this strategy is the website [www.eximtours.cz](http://www.eximtours.cz) of the travel agency EXIM TOURS a.s. The main aim of the strategy is to increase the traffic of these sites through optimization; such optimization will enable them to appear as the results of full-text searches in the search engines Seznam.cz and Google.cz, bolstering them to first place results with phrase keywords relating to the business subject, in addition to online communication channels such as blogs, email, and social networks. The thesis also includes information on the timely distribution of desirable, client-tailored content to clients and potential customers. Another inbound marketing phase is the generation of leads through landing pages and offers of downloadable content in exchange for a client or potential client's email contact, which the company then stores in its database in order to offer the user content in which they have shown interest in the future. This enables the company to increase the information and education offered to the user and helps fully prepare the potential client to follow through with the product purchase.

The last phase of inbound marketing explored in this thesis is customer care and the cultivation of mutual trust between company and client.

## Electronic banking

Vladimír Očenášek, David Špaček

**Keywords:** contactless credit cards, contactless payments, NFC

**Abstract:** Nowadays, lot of people own credit card and this kind of payment becomes more and more dominant in Czech Republic. Few years ago, an innovation in the form of contactless credit cards took place and now we are dealing with another thing, which is mobile payments through mobile devices. So, the ways of payments are developing very fast and this dissertation is supposed to bring a view on their development and actual theme of contactless credit cards.

The theoretical part of my dissertation is mostly focusing on the development of credit cards in the world. Both in terms of credit cards and associations that issue them. Last but not least, there is a part in which the technology of NFC is described. That technology is very important for mobile payments.

The practical part, in the first place, is dealing with statistical data of payments by credit cards in Czech Republic. This analysis shows, how the Czech population use these resources. Next, you can find an analysis that compares countries of European Union and shows us how the Czech Republic stands against other countries. Lastly, a questionnaire survey is made. This survey is supposed to check Czech population in using contactless credit cards and then

compare it with previous results. Also, important part of this survey is detecting awareness of consumers about NFC technology.

## **Virtually synchronous replication techniques in relational databases**

**Jan Tyrychtr, Radim Špigel**

**Keywords:** relational database, synchronous replication, mysql, galera, data scaling

**Abstract:** The goal of this thesis is to acquaint one with replication problematic in relational database clusters and also with the possibilities of scaling database systems and design extension for current scaling solution for Sklik.cz system. This thesis includes a comparison of asynchronous replication and a new implementation of synchronous replication. It also contains an overview about types of architectures possible to use with building database clusters. The thesis describes the analysis and design of extension of the server with an author's own solution which allows one to scale the data in Sklik.cz system. The knowledge gained from theoretical base is applied for design extension of current sharding solution on Sklik.cz. Furthermore, the work itself contains a description in pseudocode, a comparison of a certain database cluster - which uses asynchronous replication - with a cluster that uses synchronous Galera cluster technology. The ending is dedicated to the results of the test of an implementation of the extension to the solution, in which there are the single master and multi master solutions on a simulated work with Sklik.cz system compared.

## **Utilization of Social networks in internet store**

**Václav Lohr, Klára Tichá**

**Keywords:** Internet, social networks, Facebook, on-line marketing, AdWords, Sklik, Google, PPC, advertising

**Abstract:** This master thesis deals with the use of social networks in the on-line store. The theoretical part deals with basic concepts of on-line marketing, social networks, and methods for evaluating the success of the Web. It also deals with definition, historical development of international and Czech social networks, analyzes their basic types. Work is devoted to marketing possibilities of social networks and Facebook in particular, focused on specific social networks and methods they can use on-line stores for their marketing and promotional purposes.

The practical part is applied to a specific Czech shop, whose performances will be part of the thesis. The author examines the possibilities that social networks provide enterprise and whether the company uses and how and what the results of their application deliver enterprise. Alternatively, the social network that the company does not use, but could be beneficial. The practical part also contains examples used advertising campaigns and their evaluation.

## **Electronization of reference service in the Police of the Czech Republic**

**Jan Jarolímek, Šárka Urbíková**

**Keywords:** Electronization, Document Management System Service, Data Mailbox, E-registry office, Police of the Czech Republic, Public Administration, ISDS, Records of criminal proceedings, RCP-online, Information system

**Abstract:** I chose the "Electronization of reference service in the Police of the Czech Republic" topic for my diploma thesis. The main thesis aim is an objective evaluation of the DMSS electronization and its gradual introduction into practice to the Police of the Czech Republic. The thesis is divided into two parts, theoretical and practical. In the theoretical part, the aim is to characterize the basic concepts of electronization and the DMSS performance of the Police. Then, there is the gradual development of DMSS electronization description at the Czech Police. The practical part of the thesis focuses on the evaluation of the state of DMSS electronization after the introduction of the ISDS at the Regional Directorate of the Police of the Ústí Region. The partial aim is primarily to compare the work of the classical and electronic registry office. Conclusions of the thesis were formulated on the base of the findings.

## Metrics ensuring web accessibility

Petr Benda, Josef Vegner

**Keywords:** webdesign, accessibility, handicap, metrics of accessibility, WCAG, decree of accessibility, accessibility methodology, assistive technologies

**Abstract:** This thesis is concerned with the accessibility of public administration web portals with an emphasis on selected accessibility metrics. Its main goal is to analyze the accessibility of selected public administration web portals and the subsequent comparison of the Czech Accessibility Decree with the worldwide standard WCAG 2.0. The theoretical background is about the issue of web accessibility, especially the description and analysis of the chosen regulations. The practical part is focused on the analysis of three selected web portals of city district Prague 16. The analysis is divided into two parts of accessibility testing. The first part is about automatic testing followed by manual testing according to the selected accessibility guidelines. The outputs of the analysis are generalized and identified as the most frequently encountered barriers to web accessibility. The last part of the thesis aims to the comparison of the Decree No. 64/2008 Coll. with the worldwide standard WCAG 2.0 and the identification of general shortcomings.

## Modern data centers

Jiří Vaněk, Jan Velehradský

**Keywords:** data center, computer network, virtualization, cloud computing, IaaS, PaaS, SaaS, server, security

**Abstract:** The thesis is focused on data center issues. The main goal of this work is to analyze infrastructure and security of the selected data center with respect to the services it should provide. In the first part of this thesis is presented current state and historical development of data centers. Furthermore, the main problematics and related technologies are described. Security methods and design solutions for data centers are also defined there. Practical part deals first and foremost with data center analysis in selected environment. The infrastructure of the selected data center and its security is presented here, as well as the design and provided services along with the technologies and procedures used. Based on the analysis of acquired knowledge, the existing solution of the selected data center is evaluated and possibilities for

improvement of its services and security are proposed. The synthesis of the theoretical and practical part is followed by the conclusions of the diploma thesis, which summarizes the results and also gives possibilities and estimation of the future development.

## Testing the usability of the CULS sites

Václav Lohr, Ondřej Veverka

**Keywords:** user experience, wireframe, user interface, Google Analytics, testing

**Abstract:** This diploma thesis deals with the analysis of the usability status of chosen university websites, designing user experience enhancements and then testing and verifying site improvements.

The theoretical part defines usability testing and its methods. Subsequently, there are described terms user experience, design, and wireframe. In the chapter about web analytics, there are described two analytics tools named Google Analytics and Google Optimize. Further, A/B testing and its use are described below.

The theoretical approaches drawn up in the previous part are used as a source for practical work. In that part an analysis and description of the original page are performed, following the definition of tasks for the users, testing of the target group of users and a summary of the most frequently mentioned shortcomings. This knowledge is applied to the design of the new website, and subsequent A/B testing determines whether the site's usability has improved. These approaches are applied to two selected university web pages.

## Wearables for Health and Fitness Enhancement: A user experience study

Miloš Ulman, Shailany Vizconde

**Keywords:** wearable efficiency, digital health, Wearable devices

**Abstract:** The scope involves investigating the extent to which smartphones and wearable devices are effective as tools to monitor various parameters such as distance covered per day, heart beat rate etc...are they as good as the medical instruments used in hospital? This study will also include on demographics of users to evaluate who wants it and why.

The partial goals is:

- To evaluate its practicability/usability and other things such as cost and accessibility,
- To identify demographics of users in order to evaluate who wants it and why

to evaluate who wants it and why

- To make recommendations on user of wearable.

## WordPress Security Plugins

Václav Lohr, Václav Vodička

**Keywords:** hacking, website, security, hacking attacs, WordPress, plugin

**Abstract:** This work analyses the effectiveness of selected WordPress security plugins. The results are interpreted and used to compare the plugins. The work includes definition of basic principles of hacking and programming languages, which are the basis for analysing security plugins, performing attacks and interpreting the results. The 10 most commonly used plugins have been analysed for protection against the 6 most common attacks on WordPress.

For each security plugin was created a WordPress site where the plugin was installed. Using the available tools and selected hacking techniques, site security has been investigated. The detected values for each attack and plugin were evaluated by the scoring method. Based on these points, the order of the plugins was determined. The overall order was determined by the ranking method as the sum of the order of the individual comparisons. To increase the objectivity of the comparison, a web-based application has been. The application evaluates the overall order of security plugins based on user-defined priorities and the results obtained from the analysis.

Until the writing of this diploma thesis there was no scientific research that would analyse the effectiveness of WordPress security plugins. The information obtained from this thesis may be useful to developers in developing new security plugins, managing plugins that are already developed, or creating web applications that may not run on WordPress.

## Use of information management in Smart Cities

Miloš Ulman, Xhesilda Vogli

**Keywords:** Smart city, urban mobility, public transportation, interoperability, e-ticketing

**Abstract:** Implementing smart city management technologies is not just a process where technology offers solutions for different problems. Smart city influences a wide range of sectors such as ecology, education, infrastructure, recycling, health, transportation and many more. Therefore, nowadays implementation of smart city is a must.

This paper describes the opportunities and challenges that countries in development are facing while implementing smart cities. During the theoretical part, a literature review is provided describing Internet of Things and Smart cities. The motivation behind this thesis is to make use of best practices already implemented in Amsterdam, Vienna and Prague. Those three cities are used as an etalon while proposing a smart public transportation for Tirana. The proposed solution takes into consideration technological and social impacts of the system, analyzing and providing a deeper understanding of the use of information management in smart cities. Finally, conclusions are made by setting out implications of Tirana's public transportation for a broader integration with other sectors as a future work.

## Social networks in banking

Vladimír Očenášek, Tomáš Vohnický

**Keywords:** analytics, content marketing, facebook, banking, Komercni banka, marketing communication, social media, communication plan

**Abstract:** Diploma thesis is about communication activities in banking sector on social media, which are very widespread tool for marketing communications these days. The thesis is divided into two parts, theoretical part or literary research and practical part.

Theoretical part describes the various social networks, including their history and functions. Most of the theoretical part is focused on Facebook. Furthermore, the theoretical part describes tools that are used in the creation of content or in analyzing the success of communication.

In the practical part I will create content, one post each month. I would like to create the most relevant content that would derive from the results that I emerged from my bachelor thesis Bank and social networks. Here I analyzed the most successful content in different months on the Facebook site G2 Komerčky.

At the end of each month, posts created by me will be analyzed in comparison with other posts on the site and I could confirm or deny whether it was content generated by me identified with the results of the analysis of my bachelor thesis.

## The use of Information Technology in specific tourism projects

Jiří Vaněk, Markéta Vondrová

**Keywords:** Information technology, website, mobile applications, tourism, partnership, cross-border cooperation program Cíl EÚS 2014-2020

**Abstract:** This thesis is mapping the benefits of information technology in recent projects of southwest Bohemia and Czech–Bavarian cooperation. The theoretical part analyzes information technology in the view of the fact of utilizing them in the tourist industry. Historical milestones, development and applications will be areas of focus. The practical part is aiming to examine a detailed analysis of the current project of the cross border cooperation; the Bavarian project Goldsteig and the newly arising mirrored project Zlatá stezka along the Czech border. The goal is to analyze currently used and future planned information technology. The conclusions of this thesis are based on both theoretical and practical knowledge. The Evaluation is going to be based on the results of the interviews with concrete project investigators.

## Virtualization with VMWare ESXi

Jiří Vaněk, Jan Zamazal

**Keywords:** VMWare, ESXi, vMotion, SAN, virtualization, Fibre Channel, iSCSI, datacenter

**Abstract:** The master s thesis deals with the issue of virtualization platform ESXi, which is developed by VMWare company, and networks used for communication host systems and shared data storages. After a brief levels of virtualization and basics of data storages problematics, the work goes on with the characteristics and history of selected virtualization solutions. The thesis analyzes some of the unique functions provided by VMWare ESXi. The practical part of the work presents results of the testing the behavior and differences two protocols which are used in the SAN network. Tests was executed by prepared testcases which simulate situations of production environment. Results of the tests are analyzed and interpreted.

## Application development for Cinterion modules

Alexandr Vasilenko, Marek Záruba

**Keywords:** IoT, Cinterion modules, Cinterion Concept Board, EHSx, Java application development, Java ME

**Abstract:** This thesis deals with application development for Cinterion modules platform. The main objective is to analyse the possibilities and the way of applications development for these modems. The knowledge from this analysis are demonstrated on the Cinterion Concept Board. The theoretical part of the thesis contains research of two basic themes needed at application

development for these modems. The first is the Java ME platform in which are applications developed. Second one is controlling language of basically all modems called AT commands. The practical part presents the way of application development. From the first connection of the modem to the computer, through the settings of development environment and implementation of the application itself till the uploading application to modem and it's following updating. In this section are also evaluated application development possibilities for these modems and they are compared to another platforms like Arduino and Raspberry Pi.

## Internet of Things in cars

Pavel Šimek, David Žid

**Keywords:** IoT, internet of things, connectivity, connected car, mobile applications, applications, e-Call, C-ROADS

**Abstract:** The thesis is focused on problematics of Internet of Things (IoT) in connected cars. Theoretical part sums up the topic of available technologies in the current and future cars. Furthermore, it incorporates the comparison of field of use for IoT based on common standards for automotive industry and C-ITS systems, which are the base ground for cooperative, connected and autonomous mobility. Thesis also refers and puts theory in context with the ongoing projects in the European Union such as eCall and C-ROADS.

Practical part is focused on design of a new information system for increase of safety of driving and on the go, using available technology described in the theoretical part. Hereafter, author realizes design of mobile app and web-based app for smart connected cars, which is presented as front-end of this intended system. Design is documented, including diagrams, pre-development analysis and the UX and UI.