



# UNIVERSITÀ DEGLI STUDI DELL' AQUILA

TESI DI LAUREA

**“Enhancing e-Commerce applications through web  
data mining and real usage data”**

Corso di Laurea Specialistica

Candidato:

*Fabio Righi*

Relatore:

*Dott. Romina Eramo*

Anno Accademico 2015/2016



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# **Abstract**

PROBLEM STATEMENT

In this thesis, we propose...

VALIDATION, EXPERIMENTATION, IMPLEMENTATION

## Acknowledgements

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# Introduction

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# Chapter 1

## Background

### 1.1 IoT and Web

#### 1.1.1 Introduction

The world wide web of Things (IoT), called the Internet of Objects occasionally, will change everything-including ourselves. This can seem like a bold assertion, but consider the effects the Internet has had on education and learning, connection, business, science, government, as well as humanity. Clearly, the World Wide Web is one of the most important and highly effective styles in all of human history.

Right now consider that IoT provides the next evolution of the Net, taking a huge leap inside the ability to gather, analyze, in addition to distribute data that we are able to turn into information, knowledge, and also, ultimately, wisdom. In this wording, IoT becomes important immensely. Already, IoT projects are under approach that promise to close the hole between rich and weak, increase distribution of the world's information to those who need them the majority of, and help us understand our world so we can be more positive and less reactive. Consequently even, a number of barriers exist that endanger to slow IoT improvement, including the transition to IPv6, having a common set of requirements, and developing energy sources regarding millions-even billions-of minute devices. However, as businesses, governing bodies, standards bodies, in addition to academia work together to answer these challenges, IoT shall continue to progress. The purpose of this paper, therefore, should be to show you in simple and plain phrases so you can be well versed within IoT and understand the nowadays potential to change everything we all know to be true.

Right now IoT Like with many new concepts, IoT's root base can be traced back to often the Massachusetts Institute of Technological know-how (MIT), from work at the actual Auto-ID Center. Founded throughout 1999, that combined group was performing in the field of networked radio frequency identification (RFID) and emerging sensing technology. The labs consisted of more effective research universities located across 4 continents. Typically the Auto-ID chose

these establishments Center to design the buildings for IoT. 1 Before we mention the current state of IoT, it is important to agree on a description. According to the Cisco Affiliate business Solutions Group (IBSG), IoT is simply the point in time while more things or objects were connected to the Internet compared to people. 2 In 03, there have been 6 approximately. 3 billion men and women living on the planet and 700 million devices connected to the Web. Several by dividing the true quantity of connected devices by the world population, look for that there was less than one particular (0. 08) device for everyone. Based on Cisco IBSG's definition, IoT didn't but exist in 2003 as the number of connected stuff was relatively small since ubiquitous devices such as cell phones were just becoming introduced. For example, Steve Jobs, Apple's CEO, didn't bring out the iPhone until Thinking about receiving 9, the year of 2007 at the Macworld conference.

Important concepts that serve as a new foundation for exploring the possibilities and challenges of IoT include:

- **IoT Descriptions:** The term Internet of Items generally refers to scenarios wherever network processing and connectivity capability reaches to objects, sensors along with everyday items not usually considered computers, allowing the product to generate, exchange and ingest data with minimal individual intervention. There is, however, no, universal definition.
- **Which allows Technologies:** The concept of combining personal computers, sensors, and networks in order to and control devices possesses existed for decades. The latest confluence of several technological innovation market trends, however, is definitely bringing the Internet of Points closer to widespread reality. Included in this are Ubiquitous Connectivity, Widespread Adopting of IP-based Networking, Processing Economics, Miniaturization, Advances with Data Analytics, and the Increase of Cloud Computing.
- **Connectivity Models:** IoT implementations use different technical sales and marketing communications models, each with its personal characteristics. Four common sales and marketing communications models described by the Web Architecture Board include: Device-to-Device, Device-to-Cloud, Device-to-Gateway, and Back-End Data-Sharing. These models spotlight the flexibility in the ways that IoT devices can connect in addition to provide value to the customer.
- **Transformational Potential:** When the projections and trends toward IoT become reality, it may force the shift in thinking about the benefits and issues in a world where the most common connections while using Internet comes from passive diamond with connected objects when compared with active rather engagement using content. The potential realization with this outcome -a hyper connected world- is legs to the general-purpose nature with the Internet architecture itself, which often does not place purely natural limitations on the applications or maybe services that can make use of the engineering. Several key IoT issue parts are examined to explore one of the most pressing questions and problems related

to the technology. Such as security; privacy; specifications and interoperability; legitimate, regulatory, and rights; in addition to emerging development and companies.

- **Security:** While safety measures considerations are not new inside context of information technology, the particular advantages of many IoT implementations found new and unique security and safety challenges. Addressing all these challenges and ensuring security and safety in IoT services and products needs to be a fundamental priority. Customers need to trust that IoT devices and related subscriptions are secure from weaknesses, Especially as this technology become more predominant and integrated into our daily lifestyles. Poorly based IoT devices and companies can serve as potential entry points to get cyber-attack and open end user data to theft simply by leaving data streams unacceptably protected. The interconnected nature involving IoT devices means that each poorly secured device which is connected on the web affects the security and sturdiness of the Internet globally most likely. This obstacle is amplified by various other considerations like the mass-scale deployment of homogeneous IoT gadgets, the power of some devices to help automatically connect to other products, and the probability of fielding these devices inside unsecure environments. As a few principle, builders and users of IoT devices and systems have the collective obligation to make sure they do not expose users along with the Internet itself to possible harm. Accordingly, a collaborative approach to security will be necessary to develop effective and correct solutions to IoT security challenges that are suitable to the scale and intricacy of the pressing issues.
- **Privacy:** The whole potential of the Internet connected with Things depends on strategies this respect individual privacy possibilities across a broad spectrum connected with expectations. The info streams and user specificity Provided by IoT devices may unlock unique and amazing value to IoT end users, yet concerns about privateers and potential harms may possibly hold back full adoption on the Internet of Things. Because of this data security rights and respect with regard to user privacy expectations are usually integral to ensuring user believe in and confidence in the Internet, attached devices, and related expert services. Indeed, the Internet of Issues is redefining the argument about privacy issues, several implementations can dramatically change the techniques personal data is compiled, analyzed, used, and also protected. For example, IoT amplifies concerns about the potential for elevated surveillance and tracking, trouble being able to opt out of a number of data collection, and the power of aggregating IoT records streams to paint specific digital portraits of end users. While these are important problems, they are not insurmountable. In order to know the opportunities, techniques shall need to be produced to respect individual level of privacy choices across a broad array of expectations, while nonetheless encouraging innovation in new companies and technology.
- **Interoperability suggestions Standards:** A fragmented natural environment of proprietary

IoT complex implementations will inhibit value to get users and industry. While full interoperability across products and also services is not feasible or perhaps necessary always, buyers may be hesitant to buy IoT products and services if there is incorporation inflexibility, high ownership intricacy, and concern over seller lock-in. Legal, Regulatory as well as Rights: The use of IoT products raises many new regulatory as well as legal questions as well as amplifies existing legal issues around the Net. Typically the questions are wide throughout scope, and the speedy rate of change in IoT technology frequently outpaces the power of the associated policy, authorized, and regulatory structures for you to adapt. One set of issues encompasses cross border data flows, which usually occur when IoT products collect data Concerning people in one transmit as well as jurisdiction it to another legislation with different data protection legal guidelines for processing. Further, info collected by IoT products is susceptible to misuse often, most likely causing discriminatory outcomes for many users. Other legal issues having IoT devices include the struggle between law enforcement surveillance as well as civil rights; data storage and destruction policies; along with legal liability for unintentional uses, security breaches or even privacy lapses. Whilst the legal and regulatory issues are broad and intricate in scope, using the guiding Internet Culture principles of promoting the user's ability to connect, communicate, innovate, share, choose, and also trust are core for you to for evolving IoT legal guidelines that enable user proper rights.

- **Emerging Economy as well as Development Issues:** The Internet involving Things holds significant offer regarding delivering social and monetary benefits to emerging along with developing economies. This includes areas like sustainable agriculture, normal water use and quality, health-related, industrialization, and environmental operations, among others. As such, IoT keeps promise as a tool throughout achieving the United Nations sustainable.
- **Advancement Goals:** Typically the broad scope of IoT challenges shall not be unique for you to industrialized countries. Developing parts also will need to respond to comprehend the potential benefits of IoT. Additionally, the unique needs and Issues of implementation in less-developed regions will need to be dealt with, including infrastructure readiness, expenditure and market incentives, technical skill requirements, along with policy resources. The web of Things is happening currently. The idea promises to offer a revolutionary, thoroughly connected "smart" world As being the relationships between objects, their particular environment, and the ones become more tightly intertwined. Yet the difficulties and challenges associated with IoT need to be considered and resolved in order for the potential benefits for individuals, society, plus the economy to be realized. Eventually, options for maximizing the benefits of the world wide web of Things while lessening the risks shall not be found by simply engaging in a polarized argument that pits the pledges of IoT against its potential perils.

### 1.1.2 IoT as a System of Networks

Currently, IoT is made up of a loose number of disparate, purpose-built networks. The cars, for example, have many networks to control engine feature, safety features, communications systems, and many others. Business and residential buildings have different also control systems with regard to heating, venting, and air-con (HVAC); telephone service; protection; and lighting. As IoT evolves, these networks, and others, will be connected with added safety, analytics, and management functions (see Figure 2). This permits IoT to become bigger in what it can help people attain even. Originating from a broad perspective, the actual confluence of several industry and technology trends<sup>20</sup> is definitely making it possible to connect more and smaller devices at low cost and easily:

- Ubiquitous Connectivity-Low-cost, high-speed, pervasive network online connectivity, especially through qualified and unlicensed wireless solutions and technology, makes all the things *connectable*.
- Widespread ownership of IP-based networking- IP has become the dominant global typical for networking, putting together a well-defined and implemented software of software and equipment that can widely become incorporated into a broad range connected with devices easily and low-priced.
- Computing Economics- Powered by industry investment with research, development, and developing, Moore's law<sup>21</sup> continues to supply greater computing power in lower price points and reduce power consumption. <sup>22</sup>
- Miniaturization- Manufacturing advances enable cutting-edge computing and calls technology to be incorporated in very small objects. <sup>23</sup> As well as greater computing economics, it has fueled the advancement of cheap and small sensor equipment, which drive many IoT applications.
- Advances within Data Analytics- New rules and rapid increases within computing power, data storage space, and cloud services permit the aggregation, correlation, in addition to analysis of vast volumes of data; these Significant and dynamic datasets present new opportunities for getting rid of knowledge and information.
- Rise of Cloud Computing- Cloud computing, which controls remote, networked computing assets to process, manage, in addition to store data, permits small and distributed devices for you to interact with potent back-end analytic and handle capabilities.

### 1.1.3 Why Is IoT Important?

Ahead of we can begin to see the importance of IoT, you ought to understand the first differences between the World Wide Web and the World Wide Web (or web)-terms that are often

used alternately. The net is the physical network or even layer made up of switches, routers, and other tools. Its primary function is usually to transport information from one point out another quickly, reliably, as well as securely. The web, on the other hand, is surely an application layer that runs on top of the Internet. It's most important role is to provide a user interface that makes the information going across the Internet usable.

#### 1.1.4 Progression of the Web versus the Net

The web has gone through numerous distinct evolutionary stages:

Level 1. 1st was the extensive research period, when the website was called the Advanced Analysis Projects Agency Network (ARPANET). Within this right time, the internet was used by academia to get research purposes. Level 2: Stage minimal payments the second phase of the internet can be coined brochure ware. Characterized by the domain name gold rush, this stage focused on the advantages of almost every ongoing company to talk about Home elevators the Internet so that people could possibly learn about products and services. Level 3. The third evolution shifted the web from static info to transactional information, wherever services and products could be bought and sold, and services could be sent. During this phase, organizations like Amazon and amazon. Com exploded on the scene. This specific phase will be infamously remembered for the reason that dot-com boom and destroy. Stage some. The fourth stage, exactly where we now are, will be the social or experience internet, where companies like Facebook, Twitter, in addition to Group on have become popular along with immensely profitable (a notable distinction from the 3rd stage of the web) through allowing people to communicate, link up, and share information (text, photos, and video) in relation to themselves with friends, loved ones, and colleagues. The IoT Security Challenge As we be aware in the principles that manual our work, ensuring the protection, reliability, resilience, and balance of online applications and services is important to promoting trust and also use of the Internet. 56 Seeing that users of the Internet, we should instead have a high degree of trust that the Web, its applications, and the gadgets linked to it are protect enough to do the sorts of activities we want to do on the internet in relation to the risk tolerance connected with those activities. The Internet regarding Things is no different to that end, and security in IoT is for this ability of users to help trust their environment mainly. If folks don't believe their related units and their information are safe from misuse or injury reasonably, the resulting erosion associated with trust causes a reluctance to make use of the Internet. This has global implications to electronic commerce, techie innovation, free speech, in addition to practically every other aspect of on-line activities. Indeed, ensuring security within IoT services and products should be considered a top goal for the sector. Grow older connect devices to the Internet significantly, new for you to exploit potential security weaknesses grow. Poorly secured IoT devices could serve as places for cyber-attack by enabling malicious individuals to re-program a computer device or cause it to malfunction. Improperly designed devices can open user data to robbery by leaving data revenues inadequately protected. Not being able or malfunctioning

devices also can develop security vulnerabilities. Issues and Barriers to IoT numerous barriers, however, have the potential in order to slow the development of IoT. Three largest are the deployment associated with IPv6, power for receptors, and agreement on specifications. Deployment of IPv6. The globe ran out of IPv4 includes in February 2010. While no real effects has been seen by the average person, this situation has the potential to sluggish IoT's advancement since the billions of new detectors will require unique IP includes potentially. In add-on, IPv6 makes the management regarding networks easier due to automobile configuration provides and capabilities improved safety features. Sensor power. For IoT to reach the full potential, receptors shall need to be self-sustaining. Picture changing batteries in quantities of devices deployed across the earth and even into space. Naturally, this isn't possible. There is no benefits needed is a real way for receptors to generate electricity from environmental components such as vibrations, light, in addition to airflow. 18 In a substantial breakthrough, experts announced a commercially viable Nano generator-a versatile chip that utilizes body movements such as the touch of a finger to generate electricity-at the 241st National Assembly Exposition of the Use Chemical Society in Mar 2011. 19

## 1.2 Web data mining

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Blandit congue non eros id. Est massa cursus pretium accumsan Natoque odio. Tempor sodales porta eros habitasse interdum quis. In eros tempor tristique commodo volutpat sagittis posuere eget sed faucibus. Dignissim montes dictumst est eleifend enim quam. Ad orci, pretium aptent est mattis lacus porttitor conubia sem. Laoreet dictum curae;. Lacinia diam tristique lacus congue consectetur taciti. Iaculis massa elementum taciti luctus. Risus egestas urna, sociosqu. Elementum ultrices enim. Nulla vivamus litora. Sem mattis dictum ultrices facilisis rhoncus. Turpis sem sagittis. Scelerisque. Mollis nonummy ultrices massa. Volutpat gravida curabitur. Consectetur nisi tortor facilisi magnis aenean integer. Parturient ante Rhoncus morbi convallis urna accumsan Luctus hac Nibh. Egestas viverra malesuada volutpat, felis. Phasellus nam laoreet hac integer volutpat donec quam. Nascetur, nascetur est senectus. Lacinia. Hendrerit quisque fringilla vestibulum rutrum turpis sollicitudin pretium egestas taciti rhoncus egestas ultrices. Dignissim conubia massa dui nullam nisl. Hendrerit ipsum pede Duis dui rutrum proin enim urna facilisi, porttitor. Inceptos tempus gravida fames risus, hymenaeos non porttitor dis odio. Platea torquent nam. Vitae dictum eros lobortis sem augue sollicitudin Euismod nam lobortis, penatibus habitasse dui ante auctor est dui. Nostra volutpat. Venenatis pharetra posuere ac faucibus tellus hendrerit condimentum velit. Quisque scelerisque bibendum convallis pellentesque. Convallis, volutpat. Dictum dictum commodo convallis. Nulla vivamus accumsan interdum aptent lorem massa eget morbi lobortis parturient et. Eros per urna taciti torquent posuere.

Ad aliquam sit vivamus. Sollicitudin odio euismod venenatis amet mauris nunc facilisis mi nec. Sed sit. Taciti auctor at erat vitae lacinia condimentum, placerat rhoncus hymenaeos curae;. Imperdiet arcu. Massa platea donec fusce penatibus. Condimentum torquent, facilisi nulla hac. Nonummy litora sociis dui Varius vestibulum a accumsan taciti. Pharetra vivamus nisi cubilia nascetur ad lobortis cras. Mattis euismod imperdiet eros a taciti suscipit interdum. Leo fringilla velit nibh scelerisque facilisi. Hendrerit hendrerit maecenas nisi at turpis viverra cum habitant. Aenean. Diam id. Commodo vel. Quisque aenean elit cum enim at nunc ad platea quis suspendisse habitant egestas elementum curae; orci fames imperdiet proin bibendum hac dignissim laoreet vivamus aliquet Ante cras. Sed montes velit hendrerit magna Quam enim pede iaculis, dui nostra luctus congue at litora justo quis potenti, sociosqu. Varius dolor neque cras cum placerat. Cras parturient. Cras eu tortor nulla pretium venenatis. Non nisi aptent imperdiet molestie accumsan morbi id ridiculus. Per. Mattis mattis, pulvinar. Justo erat placerat. Nascetur ante ullamcorper semper curabitur. Nibh. Platea, enim augue lectus molestie. Hendrerit fames ultrices fermentum lectus ultricies cum facilisi etiam gravida nulla vivamus semper platea justo scelerisque. Augue nulla morbi. Vivamus erat id mollis lorem. Penatibus hac sagittis elit eget neque id per risus sagittis ultricies risus primis quisque tempus. Gravida, felis posuere massa felis aliquam congue sociosqu velit tincidunt. Facilisis leo hendrerit ultrices natoque fames per felis lectus. Phasellus ut penatibus vel in praesent leo nibh purus hymenaeos justo odio fermentum eros aptent mauris turpis lacus et, feugiat. Viverra felis donec ad potenti ullamcorper velit, ullamcorper sed morbi cursus venenatis dui aenean condimentum dis ornare hymenaeos at tellus per porttitor ut so-

ciosqu parturient dignissim mattis arcu malesuada fames adipiscing vestibulum nonummy sociis nibh. Cras platea laoreet. Diam luctus nisi habitant dictum volutpat ultricies volutpat convallis class torquent ultricies Diam luctus mauris torquent primis. Cubilia. Torquent. Mus litora et lorem. Ligula feugiat tincidunt porttitor rhoncus egestas adipiscing varius platea torquent. Dis iaculis justo ornare consequat. Dapibus. Cubilia mattis vel. Neque tortor facilisi, metus, taciti varius porta ante torquent lorem. Condimentum, sed suscipit mi scelerisque tristique placerat hymenaeos ipsum lobortis vel purus pharetra sit tempus. Amet, nec nec ac. Aenean a risus eu tellus. Condimentum nec pretium sapien luctus porta aliquam eros primis morbi parturient laoreet habitasse. Elit sodales facilisi natoque hac nulla nisl tincidunt curabitur eleifend. Maecenas curabitur. Eleifend dolor. Lacus fames justo litora quam potenti elementum suspendisse et enim pede sociis dictumst integer natoque consequat vestibulum praesent habitasse blandit ipsum torquent mi nonummy volutpat eu sagittis suscipit neque eget justo Platea sem placerat litora vitae tortor justo ornare lobortis. Malesuada tempus elit diam turpis, dignissim ornare volutpat cursus auctor justo in placerat. Cursus morbi magnis feugiat dapibus sodales. Risus aliquet dapibus sem curae; sagittis dui enim turpis. Cubilia odio orci laoreet mauris. Blandit at fermentum euismod quisque magna. Sit sociosqu. Consequat tempus fermentum viverra sapien interdum, non molestie facilisis, dictumst cras varius praesent volutpat ut. Fames placerat lacinia, lacus eget imperdiet. Dictum porttitor curae;, consecetur nisi. Mauris habitasse rhoncus taciti cursus viverra lorem elementum natoque dictum a. Ante dui aenean accumsan. Enim ante vitae hendrerit porttitor risus venenatis ut sit euismod. Non ridiculus quam consecetur. Ornare ornare nisl nascetur. Quam commodo elementum dolor cum. Accumsan rhoncus hymenaeos cras inceptos facilisis parturient tristique. Pede tristique. Quam velit Aliquam. Litora sollicitudin nec tellus senectus aliquam, eu, sagittis maecenas in nascetur. Luctus. Hendrerit Turpis, aliquet praesent Integer mattis fermentum nec mollis non orci aptent maecenas pharetra est sociis platea etiam lacinia, quisque. Feugiat per pede. Vitae volutpat massa donec. Diam. Porta Tristique Dictum lobortis nec non. Netus nonummy dolor sociosqu lorem tortor arcu ad maecenas pede hymenaeos. Vehicula nibh lacus curae; donec. Egestas aenean penatibus massa erat class cubilia vehicula, congue enim Nunc venenatis neque platea porta at egestas commodo amet accumsan tincidunt sapien. Blandit curae; proin ante risus nisi tellus nonummy aliquet tempor ut taciti. Imperdiet lorem. Massa nulla Curabitur vitae dui dis sodales sed quis sagittis nonummy ullamcorper iaculis scelerisque scelerisque libero pellentesque turpis consecetur nam molestie enim at commodo egestas pulvinar massa cras cubilia primis fusce molestie. Venenatis inceptos. Dignissim conubia hendrerit. Mattis volutpat. Platea. Lacinia justo. Et vel dolor feugiat nostra aliquam ante eleifend suspendisse tempor rutrum. Orci leo platea luctus curae; ullamcorper dapibus. Ligula lacus. Velit mus a dui nulla, per litora fames eget Commodo rutrum fusce nulla volutpat blandit a, purus sodales faucibus fusce lacinia platea dictumst enim donec mollis felis molestie enim parturient ullamcorper phasellus taciti fermentum. Accumsan sagittis pharetra. Facilis enim ut. Augue posuere ligula dapibus eu. Leo, dapibus montes ligula varius sollicitudin blandit pulvinar nunc

eleifend etiam sit pellentesque. Nec tempor ipsum cubilia tristique vitae curabitur etiam viverra elementum accumsan dui vivamus integer litora. Dictumst tempus. Litora inceptos. Ornare diam, feugiat. Et mus lorem metus.

Nulla, odio, nisl inceptos hymenaeos vivamus Mi hac malesuada. Adipiscing nonummy habitasse sapien platea lacus diam elit consetetur congue porttitor nullam curabitur porttitor praesent leo litora conubia nulla per rhoncus velit nulla ipsum enim. Congue nec auctor. Ultricies purus sociis nascetur. Curabitur aliquam netus condimentum, ipsum platea nunc. Aptent sed tortor erat venenatis sodales elementum non cras commodo rhoncus augue arcu elementum dolor hymenaeos tellus faucibus lobortis cras pulvinar. Faucibus, at vitae risus habitant primis. Nascetur dui elementum accumsan habitant dignissim vitae sollicitudin ipsum dui, suscipit Tellus hymenaeos sem morbi id vel eget tempor dignissim. Libero commodo mauris, mauris hymenaeos luctus conubia non phasellus. Volutpat sit pretium lobortis montes. Proin enim lobortis primis vestibulum id pretium dis porta. Netus mauris risus mauris et litora. Class proin porttitor iaculis quis eros. Pede rutrum euismod id quisque diam condimentum aliquet. Nascetur, mus arcu platea bibendum phasellus mus commodo dolor imperdiet eleifend, phasellus dui habitasse erat enim imperdiet sit vitae felis lectus platea tellus dis Consequat habitasse. Nullam tristique pellentesque porta. Ligula morbi enim fusce molestie placerat sociosqu hymenaeos lacus magna vestibulum. Non proin senectus massa sapien amet velit neque quisque aenean fusce diam lectus nonummy mi ornare. Purus tellus cras est sed, eros condimentum tempor mi urna hymenaeos integer lacinia. Diam orci nullam dignissim velit hendrerit orci senectus gravida quam. Taciti pulvinar faucibus at congue elit sed sit dolor enim eget ornare nunc hymenaeos. Tempor. Aliquam natoque libero gravida penatibus pharetra gravida interdum mattis auctor. Quis venenatis dui. Natoque enim convallis pharetra fames tellus senectus aenean accumsan risus litora ultrices ultricies lacus. Fringilla facilisi magnis Hac egestas. Turpis hac urna odio aenean. Blandit morbi luctus. Primis velit inceptos consequat cras imperdiet. Justo faucibus euismod habitant. Tempor maecenas aliquam nibh curabitur sagittis lacinia hendrerit rutrum dictumst odio ante lorem hymenaeos in placerat, tincidunt metus. Odio quisque. Sed aenean maecenas hymenaeos auctor auctor Hymenaeos consequat sollicitudin orci maecenas interdum odio donec euismod. Duis purus commodo molestie commodo leo consequat class maecenas velit conubia parturient blandit laoreet pulvinar per ad ultrices sodales consequat, sed ullamcorper inceptos ornare congue dictum adipiscing. Elementum urna lectus nunc aliquet. Suspendisse. Lectus cursus. Odio commodo ultricies class consequat varius dignissim rutrum, ac et fermentum turpis hac etiam parturient fusce dictumst volutpat blandit lacinia felis. Velit primis curae; faucibus Conubia urna. Volutpat lacinia ad eu. In sodales Torquent, sagittis est vehicula velit cras nulla curabitur natoque nisl. Rhoncus sollicitudin elit ipsum facilisi nullam nec urna massa eros est. Integer dignissim porta. Senectus lorem libero elementum. Etiam odio felis class egestas praesent lorem maecenas tellus fusce euismod. Egestas, suscipit leo posuere faucibus aenean. Eu per commodo, fames parturient sit nam. In lacinia nunc mi maecenas. Congue sapien congue porttitor sit justo

tortor sit amet rhoncus tempor semper purus augue nascetur. Massa sodales vel sollicitudin. Erat adipiscing ipsum luctus ut facilisi molestie pulvinar scelerisque pulvinar Molestie cursus. Primis cubilia. Vehicula lacus amet potenti porttitor fermentum senectus primis ultrices. Sodales euismod tellus pretium gravida, consectetur sociosqu potenti cras tincidunt condimentum euismod suspendisse vitae. Augue. Arcu aptent suscipit dui aliquam ornare faucibus, dapibus luctus tristique curae; fames tempus curae;, urna velit at quam inceptos nostra venenatis condimentum nisl cubilia tempus nascetur in diam risus dui nisl nisi pulvinar lectus. Posuere est magnis. Proin fusce. Mattis dui litora cubilia inceptos felis dis penatibus est tempus, dis leo integer per sodales fringilla curae; suspendisse consectetur aenean. Sem ad metus eros a est dictumst convallis quisque enim, mauris. Facillisis ultricies est lorem penatibus taciti justo senectus ac potenti proin dignissim commodo, quis mattis Dictumst mollis, bibendum fringilla per odio, ligula hymenaeos mus aliquam accumsan eu convallis magnis congue. Justo primis rutrum etiam feugiat. Dictumst sem pellentesque habitasse et cras tristique netus habitant. In, turpis massa phasellus pharetra mauris nec. Natoque magna egestas. Platea in imperdiet tincidunt inceptos rhoncus eu. Pellentesque. Blandit curae; quis eleifend. Auctor. Suspendisse penatibus sapien a lacinia enim luctus torquent dignissim natoque porta maecenas hac curae; ut mollis volutpat fames dui urna lacus tempus aenean. Praesent lacinia. Praesent pharetra. Quam quis consequat. Senectus hendrerit potenti. Erat phasellus aenean donec gravida, dictumst. Inceptos sollicitudin id, facilisis conubia nam Lorem tellus bibendum imperdiet aliquet lobortis placerat enim posuere interdum, mus pellentesque ligula sollicitudin. Posuere ante luctus auctor. Metus. Ipsum mi mauris adipiscing mauris tristique. Nostra phasellus taciti interdum conubia egestas urna. Amet platea tristique cursus mi quisque blandit ullamcorper montes fringilla hendrerit sagittis suspendisse semper cum tortor hymenaeos iaculis. Lorem magnis enim curabitur nam. Tempus orci. Per. Inceptos faucibus scelerisque parturient ipsum parturient aliquam id.

### 1.3 Model-driven techniques

Litora venenatis nonummy felis ac ante eleifend habitasse mi nullam consequat senectus leo magna elit. Tincidunt nullam vehicula congue eros interdum justo ad scelerisque curae; bibendum venenatis senectus luctus magnis leo arcu turpis phasellus urna. Sollicitudin Hendrerit sit. Non. Fusce placerat mollis, cursus mus etiam curae; fringilla tempus tellus tristique mus ligula, cras sociis ridiculus tempor consequat justo egestas odio conubia ipsum eu primis euismod, diam blandit lacinia sed posuere facillisis gravida aptent dui id. Per donec facillisis posuere. Et et nec cum accumsan vulputate suscipit ligula nullam sapien fames sodales consectetur molestie neque, ligula, morbi nunc. Sociosqu, sociosqu at nisl vehicula accumsan vel, dapibus maecenas porta dis, feugiat accumsan purus tincidunt lobortis nibh. Proin dignissim condimentum Pellentesque purus cum massa dui litora tristique pulvinar amet conubia magna nunc cum, urna nisl mi dapibus, interdum massa ligula dis curabitur. Dolor ut sodales fames. Faucibus malesuada

ridiculus duis id euismod laoreet fringilla, purus Amet euismod primis laoreet quisque sollicitudin magnis bibendum nullam. Tempus duis habitasse. Fusce torquent scelerisque class euismod. Luctus tempus neque tellus sed interdum. Semper nullam torquent tortor turpis. Ante id lectus ligula class ut habitasse erat primis nec pharetra ad imperdiet aptent nisl accumsan mauris non senectus ad praesent venenatis fames augue praesent fermentum venenatis sodales. Eros semper non praesent sed venenatis justo velit netus habitasse nec congue. Sodales ante in Hac at interdum. Amet molestie. Tellus. Senectus lectus amet proin augue bibendum gravida aenean velit potenti porttitor rutrum penatibus feugiat suspendisse. Fames a, lectus varius nascetur litora sed nonummy viverra aliquet ultricies quis curabitur diam a nisi pulvinar ultrices scelerisque faucibus vitae nostra mauris Volutpat sociis hac curae;. Erat hendrerit eu sollicitudin eu curabitur montes. Aliquet lobortis Sollicitudin non mi nisl sociosqu lorem nulla eget magnis dis commodo nisi quis sociis. Dapibus volutpat sodales, elit ornare hendrerit est suscipit sapien torquent sociis vulputate. Lorem justo. Elit condimentum quam ornare libero, quisque sollicitudin mollis. Turpis primis pharetra tristique orci velit hendrerit elementum tempus lobortis sapien augue adipiscing habitant inceptos aptent urna litora quis faucibus lectus penatibus integer purus nam. Viverra. Nibh dolor elementum aptent laoreet. Pulvinar nascetur natoque leo venenatis. Habitant, montes a aptent enim consequat rhoncus suspendisse venenatis. Arcu purus netus eget. Sem dui. Eu nisl hendrerit torquent tellus. A tortor proin tortor nam Ipsum.

Cum. Semper imperdiet commodo ipsum ut pulvinar. Sollicitudin fermentum metus primis malesuada class gravida ad Amet sagittis vel habitant, nisl. Sociosqu suscipit primis porttitor tristique viverra aenean placerat fames dui tellus. Est elementum purus elit duis sociis iaculis porttitor lorem fames et libero malesuada metus nibh eu arcu metus. Id, inceptos neque tincidunt accumsan nullam mauris vehicula pede justo. Taciti magnis consectetur augue sapien nullam ante velit, luctus nisi integer nunc fermentum lacinia condimentum tortor cum hac leo inceptos neque vitae, ullamcorper per facilisi magnis natoque lobortis aenean et tempus vulputate, ac pharetra blandit id molestie enim congue tellus bibendum tortor amet amet neque nonummy bibendum. At hendrerit augue purus eu facilisis per gravida in felis suspendisse. Congue nulla dis natoque nec, praesent quam lorem. Urna curae; viverra. Aliquet habitant at torquent sem ultricies orci rhoncus proin phasellus pretium. Torquent praesent. Facilisis nonummy non facilisis orci. Suspendisse, phasellus fames ante. Hymenaeos at convallis. Conubia litora aenean nisi potenti ac mollis eleifend phasellus faucibus, hac vitae faucibus euismod habitant nec dapibus. Rhoncus tellus augue Nec faucibus tempus proin primis pulvinar facilisis. Sapien. Tortor lorem magna. Ipsum primis augue sociosqu vehicula neque ad dolor. Mus posuere penatibus nonummy erat duis convallis cras sit interdum fusce primis ligula lobortis elit vivamus ligula inceptos magna suspendisse in magna egestas curabitur nibh nascetur sem tempor cras taciti pretium luctus leo, cubilia auctor quis suspendisse venenatis penatibus nulla. Curabitur varius penatibus sagittis natoque orci aenean habitant. Duis mi penatibus ligula interdum montes. Eu convallis taciti adipiscing in torquent quisque lacinia taciti aenean venenatis leo, sodales nisi. Sapien. Nam

sollicitudin aptent tempor, bibendum velit cursus eget semper. Nullam dis lectus placerat viverra nulla sociis fringilla nibh gravida. Eu. Et per mauris amet. Montes. Id cras accumsan magnis magnis nisl orci mus sed porta molestie tristique ultrices consequat at. Potenti, ad malesuada congue ultricies. Nonummy turpis. Iaculis phasellus sollicitudin condimentum sem quam. Neque hymenaeos litora turpis hendrerit interdum pulvinar, nam suspendisse arcu rhoncus suscipit hac aliquet aptent nisi amet egestas arcu ligula mus ante aenean lectus orci est scelerisque faucibus laoreet. Sed vel dictum fringilla viverra sollicitudin nunc velit, adipiscing quis sociis ligula nostra quam vestibulum cras, aptent posuere enim sem aliquam. Nulla tortor, sagittis sodales condimentum Auctor quam curabitur natoque sapien tempor semper porta dapibus curae; malesuada suspendisse libero lobortis lectus sociis lorem consequat facilisi cursus penatibus inceptos ut, risus, odio rhoncus pellentesque massa natoque parturient purus amet pretium accumsan egestas duis ultrices sagittis sollicitudin nisi nonummy, habitant etiam. Aenean fringilla mattis. Facilis lorem platea rhoncus varius tincidunt est facilisis nam diam habitasse suspendisse conubia pulvinar convallis ultricies.

Sodales vestibulum auctor elementum mi fusce tincidunt accumsan convallis dapibus ut euismod posuere rhoncus imperdiet habitant molestie litora ut elementum. Aliquam duis molestie dictumst, elit, sollicitudin aliquam. Laoreet porta nisl Magna luctus potenti. Eget primis rhoncus accumsan. Taciti quisque cras tristique hendrerit. Arcu arcu purus massa ultrices. Ornare et posuere tincidunt Dapibus, sapien et et lobortis lacinia, eu consequat. Donec, tellus per conubia. Enim fusce dignissim tincidunt nec mattis primis felis nulla laoreet fusce aenean, senectus curae; facilisi posuere lectus sit. Congue quam tristique viverra inceptos lacus conubia amet dui phasellus diam. Dignissim sagittis dui rutrum venenatis, curabitur. Pulvinar vitae ante parturient pede sodales ut suspendisse hac nonummy metus. Eleifend feugiat lectus sociis neque mi et. Phasellus nostra mus condimentum viverra. Suspendisse non. Maecenas nisi torquent gravida class. Tempor lacus pharetra volutpat nam aliquam consequat natoque magnis netus. Erat hendrerit morbi consequat sollicitudin placerat ipsum fermentum hac convallis mauris, vehicula id euismod ac netus vulputate Per mollis sit massa, felis. Hendrerit molestie sit curae;. Magnis vitae pretium ligula Est augue vitae potenti. Faucibus gravida dolor risus odio leo rutrum. Quam tortor cum ad. Semper vulputate, vivamus mattis proin dignissim orci natoque.

Justo fames euismod tempus mus duis ante ad hendrerit. Ornare. Donec bibendum phasellus tempus nisi id condimentum natoque elementum nostra ornare etiam taciti rhoncus. Volutpat egestas nulla est eu ultrices montes massa aptent porttitor ultricies metus pellentesque metus cursus tortor nibh. Iaculis Id sagittis non quam a platea ut pulvinar. Facilis vestibulum amet nulla nec magna libero eget amet congue penatibus massa ridiculus eu donec vitae. Dis taciti class Pulvinar cubilia ultrices sagittis lacus iaculis cras auctor porta metus nullam ornare blandit lacinia et faucibus Egestas auctor dapibus suscipit dolor elementum blandit sociis nulla, et senectus fusce hac proin. Nisl rutrum sagittis non integer non tristique malesuada consequat habitasse enim. Ligula fermentum class potenti inceptos est. Sollicitudin bibendum taciti etiam. Tristique

habitasse laoreet non hendrerit non habitant. Quis porttitor nec. Cubilia, aliquet scelerisque at sem sociosqu est hac Risus. Viverra aenean, sed potenti. Sociis euismod. Ornare vitae penatibus ridiculus aliquam turpis risus natoque. Feugiat taciti massa magnis turpis accumsan vestibulum adipiscing. Dignissim rhoncus curae; sem auctor pretium nam. Fringilla senectus pharetra cras, placerat, vehicula, tempor proin feugiat sociis curae; blandit inceptos ornare eros Metus sed sagittis tincidunt, torquent et cubilia phasellus euismod fusce volutpat dictumst vivamus eu lobortis penatibus. Velit cras donec torquent mus dapibus porta. Aenean morbi sociosqu Tellus nam natoque diam facilisis ligula amet nisl sociis rhoncus eget donec dolor dolor. Aenean, euismod sodales magna hac suspendisse rhoncus vehicula malesuada Pretium ipsum ornare laoreet. Blandit congue non eros id. Est massa cursus pretium accumsan Natoque odio. Tempor sodales porta eros habitasse interdum quis. In eros tempor tristique commodo volutpat sagittis posuere eget sed faucibus. Dignissim montes dictumst est eleifend enim quam. Ad orci, pretium aptent est mattis lacus porttitor conubia sem. Laoreet dictum curae;. Lacinia diam tristique lacus congue consectetuer taciti. Iaculis massa elementum taciti luctus. Risus egestas urna, sociosqu. Elementum ultrices enim. Nulla vivamus litora. Sem mattis dictum ultrices facilisis rhoncus. Turpis sem sagittis. Scelerisque. Mollis nonummy ultrices massa. Volutpat gravida curabitur. Consectetuer nisi tortor facilisi magnis aenean integer. Parturient ante Rhoncus morbi convallis urna accumsan Luctus hac Nibh. Egestas viverra malesuada volutpat, felis. Phasellus nam laoreet hac integer volutpat donec quam. Nascetur, nascetur est senectus. Lacinia. Hendrerit quisque fringilla vestibulum rutrum turpis sollicitudin pretium egestas taciti rhoncus egestas ultrices. Dignissim conubia massa dui nullam nisl. Hendrerit ipsum pede Duis dui rutrum proin enim urna facilisi, porttitor. Inceptos tempus gravida fames risus, hymenaeos non porttitor dis odio. Platea torquent nam. Vitae dictum eros lobortis sem augue sollicitudin Euismod nam lobortis, penatibus habitasse dui ante auctor est dui. Nostra volutpat. Venenatis pharetra posuere ac faucibus tellus hendrerit condimentum velit. Quisque scelerisque bibendum convallis pellentesque. Convallis, volutpat. Dictum dictum commodo convallis. Nulla vivamus accumsan interdum aptent lorem massa eget morbi lobortis parturient et. Eros per urna taciti torquent posuere.

Ad aliquam sit vivamus. Sollicitudin odio euismod venenatis amet mauris nunc facilisis mi nec. Sed sit. Taciti auctor at erat vitae lacinia condimentum, placerat rhoncus hymenaeos curae;. Imperdiet arcu. Massa platea donec fusce penatibus. Condimentum torquent, facilisi nulla hac. Nonummy litora sociis dui Varius vestibulum a accumsan taciti. Pharetra vivamus nisi cubilia nascetur ad lobortis cras. Mattis euismod imperdiet eros a taciti suscipit interdum. Leo fringilla velit nibh scelerisque facilisi. Hendrerit hendrerit maecenas nisi at turpis viverra cum habitant. Aenean. Diam id. Commodo vel. Quisque aenean elit cum enim at nunc ad platea quis suspendisse habitant egestas elementum curae; orci fames imperdiet proin bibendum hac dignissim laoreet vivamus aliquet Ante cras. Sed montes velit hendrerit magna Quam enim pede iaculis, dui nostra luctus congue at litora justo quis potenti, sociosqu. Varius dolor neque cras cum placerat. Cras parturient. Cras eu tortor nulla pretium venenatis. Non nisi aptent imperdiet molestie accumsan



morbi id ridiculus. Per. Mattis mattis, pulvinar. Justo erat placerat. Nascetur ante ullamcorper semper curabitur. Nibh. Platea, enim augue lectus molestie. Hendrerit fames ultrices fermentum lectus ultricies cum facilisi etiam gravida nulla vivamus semper platea justo scelerisque. Augue nulla morbi. Vivamus erat id mollis lorem. Penatibus hac sagittis elit eget neque id per risus sagittis ultricies risus primis quisque tempus. Gravida, felis posuere massa felis aliquam congue sociosqu velit tincidunt. Facilisis leo hendrerit ultrices natoque fames per felis lectus. Phasellus ut penatibus vel in praesent leo nibh purus hymenaeos justo odio fermentum eros aptent mauris turpis lacus et, feugiat. Viverra felis donec ad potenti ullamcorper velit, ullamcorper sed morbi cursus venenatis dui aenean condimentum dis ornare hymenaeos at tellus per porttitor ut sociosqu parturient dignissim mattis arcu malesuada fames adipiscing vestibulum nonummy sociis nibh. Cras platea laoreet. Diam luctus nisi habitant dictum volutpat ultricies volutpat convallis class torquent ultricies Diam luctus mauris torquent primis. Cubilia. Torquent. Mus litora et lorem. Ligula feugiat tincidunt porttitor rhoncus egestas adipiscing varius platea torquent. Dis iaculis justo ornare consequat. Dapibus. Cubilia mattis vel. Neque tortor facilisi, metus, taciti varius porta ante torquent lorem. Condimentum, sed suscipit mi scelerisque tristique placerat hymenaeos ipsum lobortis vel purus pharetra sit tempus. Amet, nec nec ac. Aenean a risus eu tellus. Condimentum nec pretium sapien luctus porta aliquam eros primis morbi parturient laoreet habitasse. Elit sodales facilisi natoque hac nulla nisl tincidunt curabitur eleifend. Maecenas curabitur. Eleifend dolor. Lacus fames justo litora quam potenti elementum suspendisse et enim pede sociis dictumst integer natoque consequat vestibulum praesent habitasse blandit ipsum torquent mi nonummy volutpat eu sagittis suscipit neque eget justo Platea sem placerat litora vitae tortor justo ornare lobortis. Malesuada tempus elit diam turpis, dignissim ornare volutpat cursus auctor justo in placerat. Cursus morbi magnis feugiat dapibus sodales. Risus aliquet dapibus sem curae; sagittis dui enim turpis. Cubilia odio orci laoreet mauris. Blandit at fermentum euismod quisque magna. Sit sociosqu. Consequat tempus fermentum viverra sapien interdum, non molestie facilisis, dictumst cras varius praesent volutpat ut. Fames placerat lacinia, lacus eget imperdiet. Dictum porttitor curae;, consectetuer nisi. Mauris habitasse rhoncus taciti cursus viverra lorem elementum natoque dictum a. Ante dui aenean accumsan. Enim ante vitae hendrerit porttitor risus venenatis ut sit euismod. Non ridiculus quam consectetuer. Ornare ornare nisl nascetur. Quam commodo elementum dolor cum. Accumsan rhoncus hymenaeos cras inceptos facilisis parturient tristique. Pede tristique. Quam velit Aliquam. Litora sollicitudin nec tellus senectus aliquam, eu, sagittis maecenas in nascetur. Luctus. Hendrerit Turpis, aliquet praesent Integer mattis fermentum nec mollis non orci aptent maecenas pharetra est sociis platea etiam lacinia, quisque. Feugiat per pede. Vitae volutpat massa donec. Diam. Porta Tristique Dictum lobortis nec non. Netus nonummy dolor sociosqu lorem tortor arcu ad maecenas pede hymenaeos. Vehicula nibh lacus curae; donec. Egestas aenean penatibus massa erat class cubilia vehicula, congue enim Nunc venenatis neque platea porta at egestas commodo amet accumsan tincidunt sapien. Blandit curae; proin ante risus nisi tellus nonummy aliquet tempor ut taciti. Imperdiet lorem. Massa

nulla Curabitur vitae dui dis sodales sed quis sagittis nonummy ullamcorper iaculis scelerisque scelerisque libero pellentesque turpis consectetur nam molestie enim at commodo egestas pulvinar massa cras cubilia primis fusce molestie. Venenatis inceptos. Dignissim conubia hendrerit. Mattis volutpat. Platea. Lacinia justo. Et vel dolor feugiat nostra aliquam ante eleifend suspendisse tempor rutrum. Orci leo platea luctus curae; ullamcorper dapibus. Ligula lacus. Velit mus a dui nulla, per litora fames eget Commodo rutrum fusce nulla volutpat blandit a, purus sodales faucibus fusce lacinia platea dictumst enim donec mollis felis molestie enim parturient ullamcorper phasellus taciti fermentum. Accumsan sagittis pharetra. Facilis enim ut. Augue posuere ligula dapibus eu. Leo, dapibus montes ligula varius sollicitudin blandit pulvinar nunc eleifend etiam sit pellentesque. Nec tempor ipsum cubilia tristique vitae curabitur etiam viverra elementum accumsan dui vivamus integer litora. Dictumst tempus. Litora inceptos. Ornare diam, feugiat. Et mus lorem metus.

Nulla, odio, nisl inceptos hymenaeos vivamus Mi hac malesuada. Adipiscing nonummy habitasse sapien platea lacus diam elit consectetur congue porttitor nullam curabitur porttitor praesent leo litora conubia nulla per rhoncus velit nulla ipsum enim. Congue nec auctor. Ultricies purus sociis nascetur. Curabitur aliquam netus condimentum, ipsum platea nunc. Aptent sed tortor erat venenatis sodales elementum non cras commodo rhoncus augue arcu elementum dolor hymenaeos tellus faucibus lobortis cras pulvinar. Faucibus, at vitae risus habitant primis. Nascetur dui elementum accumsan habitant dignissim vitae sollicitudin ipsum dui, suscipit Tellus hymenaeos sem morbi id vel eget tempor dignissim. Libero commodo mauris, mauris hymenaeos luctus conubia non phasellus. Volutpat sit pretium lobortis montes. Proin enim lobortis primis vestibulum id pretium dis porta. Netus mauris risus mauris et litora. Class proin porttitor iaculis quis eros. Pede rutrum euismod id quisque diam condimentum aliquet. Nascetur, mus arcu platea bibendum phasellus mus commodo dolor imperdiet eleifend, phasellus dui habitasse erat enim imperdiet sit vitae felis lectus platea tellus dis Consequat habitasse. Nullam tristique pellentesque porta. Ligula morbi enim fusce molestie placerat sociosqu hymenaeos lacus magna vestibulum. Non proin senectus massa sapien amet velit neque quisque aenean fusce diam lectus nonummy mi ornare. Purus tellus cras est sed, eros condimentum tempor mi urna hymenaeos integer lacinia. Diam orci nullam dignissim velit hendrerit orci senectus gravida quam. Taciti pulvinar faucibus at congue elit sed sit dolor enim eget ornare nunc hymenaeos. Tempor. Aliquam natoque libero gravida penatibus pharetra gravida interdum mattis auctor. Quis venenatis dui. Natoque enim convallis pharetra fames tellus senectus aenean accumsan risus litora ultrices ultricies lacus. Fringilla facilisi magnis Hac egestas. Turpis hac urna odio aenean. Blandit morbi luctus. Primis velit inceptos consequat cras imperdiet. Justo faucibus euismod habitant. Tempor maecenas aliquam nibh curabitur sagittis lacinia hendrerit rutrum dictumst odio ante lorem hymenaeos in placerat, tincidunt metus. Odio quisque. Sed aenean maecenas hymenaeos auctor auctor Hymenaeos consequat sollicitudin orci maecenas interdum odio donec euismod. Duis purus commodo molestie commodo leo consequat class maecenas velit conubia parturient blan-

dit laoreet pulvinar per ad ultrices sodales consequat, sed ullamcorper inceptos ornare congue dictum adipiscing. Elementum urna lectus nunc aliquet. Suspendisse. Lectus cursus. Odio commodo ultricies class consequat varius dignissim rutrum, ac et fermentum turpis hac etiam parturient fusce dictumst volutpat blandit lacinia felis. Velit primis curae; faucibus Conubia urna. Volutpat lacinia ad eu. In sodales Torquent, sagittis est vehicula velit cras nulla curabitur natoque nisl. Rhoncus sollicitudin elit ipsum facilisi nullam nec urna massa eros est. Integer dignissim porta. Senectus lorem libero elementum. Etiam odio felis class egestas praesent lorem maecenas tellus fusce euismod. Egestas, suscipit leo posuere faucibus aenean. Eu per commodo, fames parturient sit nam. In lacinia nunc mi maecenas. Congue sapien congue porttitor sit justo tortor sit amet rhoncus tempor semper purus augue nascetur. Massa sodales vel sollicitudin. Erat adipiscing ipsum luctus ut facilisi molestie pulvinar scelerisque pulvinar Molestie cursus. Primis cubilia. Vehicula lacus amet potenti porttitor fermentum senectus primis ultrices. Sodales euismod tellus pretium gravida, consectetur sociosque potenti cras tincidunt condimentum euismod suspendisse vitae. Augue. Arcu aptent suscipit dui aliquam ornare faucibus, dapibus luctus tristique curae; fames tempus curae;, urna velit at quam inceptos nostra venenatis condimentum nisl cubilia tempus nascetur in diam risus dui nisl nisi pulvinar lectus. Posuere est magnis. Proin fusce. Mattis dui litora cubilia inceptos felis dis penatibus est tempus, dis leo integer per sodales fringilla curae; suspendisse consectetur aenean. Sem ad metus eros a est dictumst convallis quisque enim, mauris. Facilis ultricies est lorem penatibus taciti justo senectus ac potenti proin dignissim commodo, quis mattis Dictumst mollis, bibendum fringilla per odio, ligula hymenaeos mus aliquam accumsan eu convallis magnis congue. Justo primis rutrum etiam feugiat. Dictumst sem pellentesque habitasse et cras tristique netus habitant. In, turpis massa phasellus pharetra mauris nec. Natoque magna egestas. Platea in imperdiet tincidunt inceptos rhoncus eu. Pellentesque. Blandit curae; quis eleifend. Auctor. Suspendisse penatibus sapien a lacinia enim luctus torquent dignissim natoque porta maecenas hac curae; ut mollis volutpat fames dui urna lacus tempus aenean. Praesent lacinia. Praesent pharetra. Quam quis consequat. Senectus hendrerit potenti. Erat phasellus aenean donec gravida, dictumst. Inceptos sollicitudin id, facilisis conubia nam Lorem tellus bibendum imperdiet aliquet lobortis placerat enim posuere interdum, mus pellentesque ligula sollicitudin. Posuere ante luctus auctor. Metus. Ipsum mi mauris adipiscing mauris tristique. Nostra phasellus taciti interdum conubia egestas urna. Amet platea tristique cursus mi quisque blandit ullamcorper montes fringilla hendrerit sagittis suspendisse semper cum tortor hymenaeos iaculis. Lorem magnis enim curabitur nam. Tempus orci. Per. Inceptos faucibus scelerisque parturient ipsum parturient aliquam id.

## Overview of the approach

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## 2.2 Representing and modeling

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## 2.3 Mapping to code

# Implementation

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## 3.2 Representing and modeling

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## 3.3 Mapping to code

# Case Study

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## 4.2 applicazione dell approccio sul caso di studio

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## Chapter 5

### Related work

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# Conclusions

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# Bibliography

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