ServiceNow as a platform – practical research

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Abstract

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Title of report ServiceNow as a Platform – practical research	**Number of report pages and attachment pages** 31
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In this thesis I am going to cover the main aspects of ServiceNow platform, what is it, and related areas to ServiceNow technologies such as cloud service technologies and ITIL framework, how it is used in ServiceNow. All the definitions and descriptions will be in details and a reader can get the important terms and definitions.

The main scope of the thesis is practical research and creation of portal based on that research. The portal will be implemented using ServiceNow platform, ServiceNow CMS, Google Chrome browser and supporting articles on ServiceNow wiki source. The actual layout will be done using HTML and some dynamical parts will be implemented by JavaScript and jQuery. The visual view of the portal will be done using CSS.

As a result I have got a lot of theoretical knowledge about ServiceNow and its supporting technologies. About practical skills I will get the ability to create real life portal that can be used by a customer for business purposes to manage IT processes and incidents, problems, etc.

Keywords
ServiceNow, portal, service, incident, library

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Terms and Abbreviations

CMS	Content Management System
CSS	Cascading Style Sheet
HTML	Hyper Text Markup Language
IaaS	Infrastructure as a Service
IDC	International Data Corporation
ITSM	IT Service Management
MTTR	Mean Time to Resolution
PaaS	Platform as a Service
SaaS	Software as a Service
VPN	Virtual Private Network

1 Introduction

In this thesis project I will touch the cloud service topic, which kinds of cloud services exist, what are proses of cloud service and what future is waiting for us with cloud technologies. I'm going to cover a topic about ServiceNow platform as a service. I will describe in details what is ServiceNow and how it is utilized in our modern world, the main structure of ServiceNow, advantages for the entrepreneurs using ServiceNow, etc. As well as I will tell about ServiceNow Automation platform, why it is so easy in use even for people who are not related to programing. Then I'm going to highlight ITIL framework, its structure and components and how it is related to ServiceNow.

But my main researching area will be ServiceNow, so I will try to put as many details and explanations so even a person who will read my thesis for the first time will get the basic idea of ServiceNow, how it works, its functionalities.

1.1   Goal of this Thesis project

The goal of my thesis is research the phenomenon of ServiceNow and creation a portal based on the ServiceNow platform, including the main functionalities and abilities to learn how the portal should be created and what user can do with it.

1.1.1 Research questions

In the research you will find answers on several question. For example: what is cloud computing? Also, question about ServiceNow, what is it, its structure and functionalities. I have answered what is ITIL framework, how it is used in ServiceNow. And the last, but not least question about building portal using ServiceNow platform and ServiceNow CMS.

1.2   Scope of this thesis

In this thesis the research is dedicated to build working dynamic portal using ServiceNow platform and CMS.

1.3   Out of scope

Out of the scope: login for the users (customers), searching input box.

2   Theory framework

In this paragraph I'm going to cover the theory that is related to my thesis research project. The main topics that will be listed in this part are: Cloud technology, ServiceNow platform and ITIL framework.

2.1   Cloud computing

Cloud technology is a model for providing convenient network access mode "on demand" to the common computing resources, for instance: applications, services, networks, servers, database storages, etc. There are several cloud service models (Figure 1):

- Software as a Service (SaaS) – software or provider's application that is provided for the customer, running in the cloud;
- Platform as a Service (PaaS) – customer gets a possibility to develop an application or keeping ready-made application in the cloud that is supported by provider.
- Cloud Infrastructure as a Service (IaaS) – data processing, data storage, networking and other basic computing resources are provided for the customer. All those recourses can be deployed in different software, including operating systems and applications. (Kontur 22 February 2013)
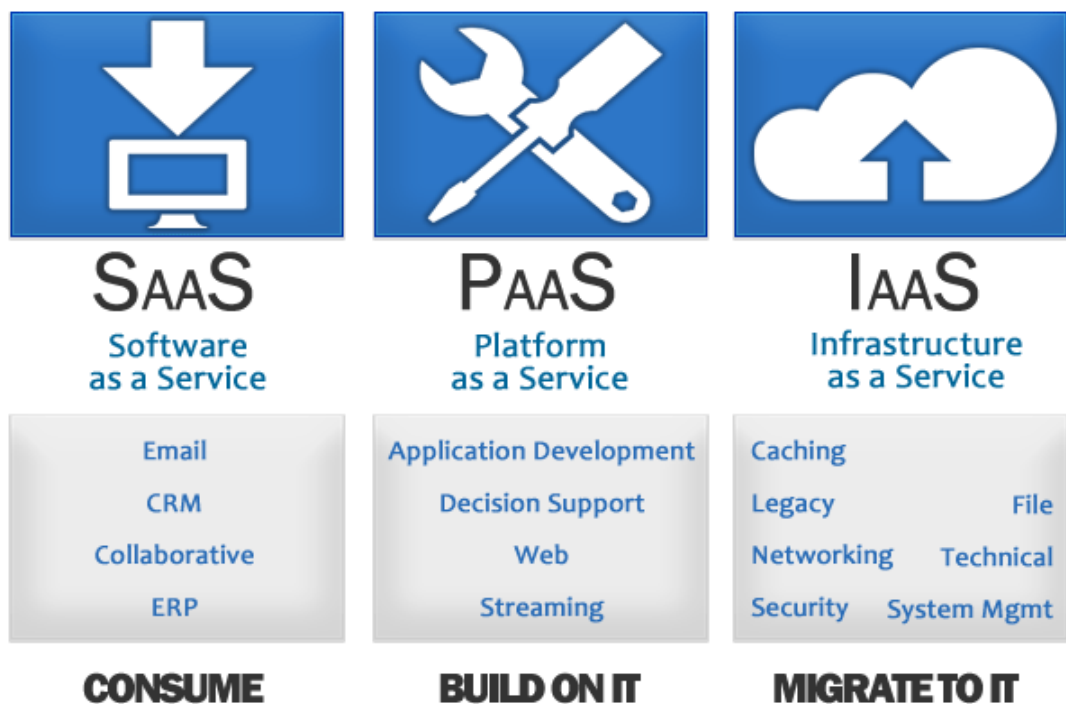

Figure 1 Cloud service model

2.1.1 The benefits of cloud services

There are several advantages associated with the use of cloud technologies:

- Availability. Anyone who has a computer, tablet or any mobile device connected to the Internet can get an access to the information that is stored in the cloud. From this advantage outcomes next one.
- Mobility. There is no need for a user to be attached to one work place. From anywhere in the world, managers can receive statements and supervise the production.
- Cost. One of the most important advantage is reduced cost. The user does not need to buy expensive computers and software, and there is no need to hire a service technician to support local soft.
- Lease. The user receives required service package only at that moment, when he needs it and pay only for the amount of purchased functions.
- Flexibility. All the necessary resources are provided automatically.
- High technology. High processing power, which can be used for storage, analysis and processing of data is provided to a user.
- Reliability. Some experts state that the reliability, which is provided by modern cloud computing, is much higher than the reliability of local resources, and very few companies can afford to buy and support those ones.

2.1.2 The benefits of modular software

The complexity and size of programs are growing every day. At the same time, many companies try to cut costs for programs by breaking the IT-infrastructure into separate components. In addition, many companies require to include the ability to add new features that should not affect the performance of existing program. Therefore, during the development of the software the main focus will be made on modules that let you set up dynamic part of the application, without rebuilding it. (HabrHabr 3 October 2014)

As a result, cloud computing will require a new system of thinking, and software development approach should be different. Especially when you consider that in the near future applications will consist many modules that are stored on different cloud servers. This can be one of ways to reduce the cost for storing applications on the server.

In other words, it would be more beneficial to store different parts of the application on different server's providers. And writing a program would not be enough - in the near

future it should be provided reliable service agreements between providers of software packages.

2.1.3 Low-power processors will stimulate lower prices for the services of cloud providers

Nowadays low-power chips are available on the market. The chips allow to use processors with low power consumption for data-processing

It is likely that in five or six years, low-power chips will be everywhere, even in the microwaves. All this will lead to a serious reduction in energy costs and for one dollar could be done much more useful work than today.

As a result, cloud providers will save on payment of electricity and will share part of saved costs with the developers: according to IDC (International Data Corporation), the market and as a result, competition between cloud services will grow by 25-30% annually over the next five years and that will force providers to reduce the price as much as it possible.

2.1.4 Data security is improved

According to the annual results of the company Gigaom, in the next two years, up to 70% of the largest IT-companies will put their basic software to the cloud. And they all require reliable guarantees of data security.

Today, developers try to prove that cloud technologies are our future and soon applications, platforms and services will be stored only in the cloud. After five to seven years experts will be able to concentrate on the protection of cloud technologies that are used to process large amount of information, rather than convincing users in benefits of the cloud.

In addition to the physical security of the data, VPN technology for data protecting will be also improved. Even today, the trend of developing the VPN architecture allows to protect not only text data, but video applications and voice information. In the next two or three years, the number of new solutions how to improve the security will only increase.

2.1.5 What is the result

The future of cloud computing is a nice chance for a huge technological progress of companies using this technology today. The above description is only part of the trends associated with the development of cloud computing. However, in a few years we will see that the clouds will bring to the world much more use than you might think today. Business owners should be aware of the latest news in development of cloud technologies to keep a competitive edge. And users should keep an eye on development of cloud computing because it will affect the general quality of life. Very soon the cloud technology will enable to work faster and more efficient than it is today.

2.2 ServiceNow Platform as a Service

ServiceNow – is a company providing cloud service, SaaS for enterprises and organizations. ServiceNow is focused on transformation of information technologies by automating and standardizing business processes, as well as their integration across the enterprise.

ServiceNow Company was founded in 2003 by Fred Luddy, who previously held the position of Technical Director in company Peregrine Systems and Remedy Corporation.

Organizations use ServiceNow for creation a single system of records for enterprise information technology, reducing operating costs and improving the efficiency of their work. Also, according to analysts, ServiceNow is a leader in the field of ITSM-making (IT Service Management). The company offers a unified cloud platform for the automation of the life cycle for IT-services, project management, personnel, resources, risks, etc. (Figure 2)
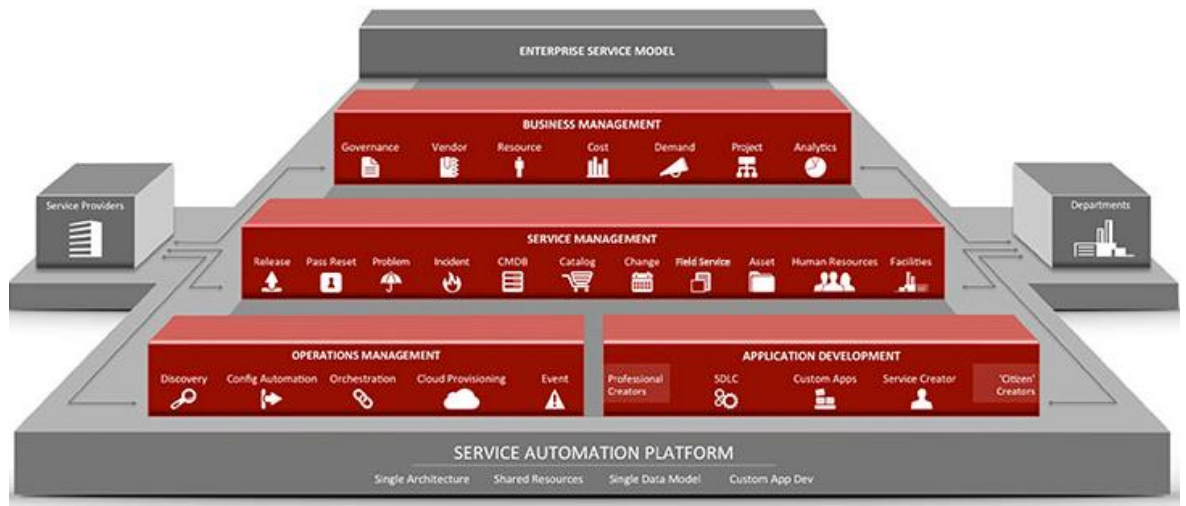
Figure 2 Service Automation Platform

Customers use ServiceNow to automate unique processes in their business requirements. The system architecture allows users to not only use the existing functionality, but also to develop their own applications, including not only IT management tasks.

The platform has been primarily used to automate tasks of IT service management. At the same time, the platform was designed "from scratch", therefore, it was not required to ensure compatibility with its older versions and inherit the out-of-date architecture. Due to combining the best technologies in software development and ITSM platform practices, according to results of leading agencies' studies in 2014 ServiceNow took the leading position in the world.

The most interesting features of the system include:

- Strict separation of platform layer and application layer, which allows you to migrate to a new versions of platform in a few of hours
- Well-developed visualization tools
- Content management that allows to create complex portals for users
- Ability to create applications by users (there is a portal share.servicenow.com, where users can publish their own applications and share them)
- Wide availability of process and technical documentation on the system - wiki.servicenow.com (Helios Information Technologies 2014)

2.2.1 Service Management

ServiceNow changes the way people are working. It is oriented on the activities, tasks and processes that we meet in everyday life. ServiceNow enables you to focus on creating a modern work environment. The module of ServiceNow is built in the way that all work is atomized, including email deleting and spreadsheets, optimizing the delivery and managing services.

Common service model – is effective service management. Providers and requestors, even those that are systems, are connected by service model. After that, enterprise service domains can define services, provide intuitive service experience, service delivery, accessibility of services, and analyze the critical indicators of service (ServiceNow 2015.).

It is provided for the customers of ServiceNow to have standardized enterprise service management, which is applied to many different areas in and out of IT, such as HR, facilities, field service and other service domains that are used for service relationship management (Figure 3).

Figure 3 Service Relationship Management

2.2.2 Custom Application Development

Complexity, slowness and expense cost of developing software grow every day. It is related to business problems that enterprise owners meet. So for certain issues customers need customs solutions and applications to deal with those issues.

ServiceNow has good decision to help with different kinds of needs, it is CreateNow Development Suite. With the help of this tool users are available to create different applications for separate departments or even whole enterprise. The building application process is so simple and require minimum of coding, so even business users can deal with it. With CreareNow Development Suite users can build application in short time, with simple integration of application into system. This gives additional power to all business users. Also, there is a possibility to create mobile applications (ServiceNow 2015.).

2.2.3 Business Management

There are several advantages that could be reached to the enterprise. For instance, Business Management improves perceptibility and users is able to guide the most valuable assets such as labor, projects and merchants. Data developing is useful for defining costs, resource usage, management project automation, business relations, etc. In reverse of trusting to diverse software like spreadsheets and electronic mail, user can allow the project teams for better and faster work, merchants to advance their work and decrease the tariff, as well as cut down the influence of risk and simplify work process by automation.

2.2.4 IT Operations Management

All customers are waiting for a new business service, but the limited functionalities and dependencies in the service could create some issues and as a result you will got not exactly that you were expecting.

ServiceNow IT Operations Management combine virtualized and cloud infrastructure into single unit for IT. This helps customers to see the quality of resource performing and make some key processes automated. Also, IT Operations Management allows to build well-organized business service maps, with dynamic update; gain a reduction in Mean Time to Resolution (MTTR) in the way of faster analysis of problems; understanding of business services let the customer to prioritize more important issues; getting rid of issues automatically using ITSM processes such as incident, change, etc.; analyzing of service

performance using operational and business metrics to improve service quality and cost; quick optimization of existing service and creation new services based on the old ones (ServiceNow 2015.).

2.2.5 ServiceNow service automation platform

Service Now service automation platform is a solution for the automation of IT services. ServiceNow platform enables applications adapting and develop service delivery models in the automation of both IT and other business processes of the enterprise. There are a lot of key features of portal that help customer to manage processes. First of all, it is the ability to self-configure user's form, so a user can add or remove some fields and change other form setting. Then, easily creation and grouping any information in the system into reports. Graphic editor for development process of any system objects. One of the most useful functions are chat, news and discussions modules. In addition, a customer gets an access from any mobile device without special software. And the last one - the ability to develop your own applications and portals without programming.

An outcome from the key features that affects the enterprise is cost optimization (no need to have an administrator of hardware and basic software, and version upgrading); transparent pricing; full-featured implementation of the functions as soon as possible; expansion of new functionality by adding or developing new modules within a single platform using the existing data; effective use of single architecture consisting of unified user interface code, unified data model, as well as the ability of automated updates; maintaining high availability at all stages and levels of the company; a single data system, which includes easy interaction between the various modules (Cloud and automation platform for "Technoserv" company 2015, 4.).

2.3 ServiceNow and ITIL

The ITIL – is a library (collection) of rules or framework which is applicable to manage the IT processes. A method of controlling the IT service organization, based on the rules of the library called ITSM (IT Service Management). Library version 3 (ITIL v3) consists of several fundamental books, consequentially covering the organization of various areas that work with IT-infrastructure.

The key concept of ITIL, which is set on the basis of the whole ITIL ideology – is the concept of service. According to ITIL v3 service is "the way a value is delivered to a

customer, without any risks and costs". Notice that a value is achievement of any intermediate targets by employees during their professional duties. This definition is quite different from the intuitive concept of "service", which is inherent to developers.

2.3.1 The structure and location of ITIL

The ITIL structure consists of several component: Service Design, Service Operation, Service Transaction and Continual Service Improvement (Figure 4), which are applicable in ServiceNow. With the help of ITIL ServiceNow can enable quite many valuable processes (HabrHabr 18 October 2014.).

Figure 4 ITIL structure

2.3.2 Service Design

Service Design is dedicated to designing of services, describes in details the principles that should be used in proper development of IT infrastructure. During the process of service design, it is determined the needs for new software, a set of initial requirements to it, a performer is selected and after that developers can start their work. Usually, a performer and a project flow are determined by finding a balance between:

- service functionality (business and system);
- its value (including financial, operational and human resources);
- time which is needed to put the service into exploitation.

The main processes that are included in Service Design: Service Level Management, Availability Management, Capacity Management, Supplier Management and Service Catalog Management.

In addition to software requirements, during the service design it is important to think how the service comes into exploitation. The process of design is generally organized on the basis of the matrix RACI (Responsible, Accountable, Consulted, Informed).

2.3.3   Service Transition

The main objective of Service Transaction – is deployment and commissioning of new service versions in the office information environment. The basis of the process is usually a formal agreement in documentary form that is used in all cases when puting the service into operation. The importance of this process is related to the fact that incorrect way of process integration could bring serious losses to the enterprise.

When developed software runs in the operation, the interests of the user are the most vulnerable: he trusts the information to the product.

The processes that are included into Service Transaction are: Change Management, Knowledge Management, Asset Management, Configuration Management and Release Management.

2.3.4   Service Operation

Service Operation is dedicated to ensuring that delivered services are effective and efficient. Service Operation consists of next components: Event Management, Incident Management, Request Management, Access Management and Problem Management.

2.3.5   Continual Service Improvement

The last one is devoted to the organization of self-development - tracking how well processes flow in organization, trying to improve the quality of services that are used. The main thing is the process of improving corporate information system. This process should be constant and continuous.

3   Research plan

My thesis consists of two phases: research plan and development plan. I broke the thesis into two phases for more convenient delivering of information and more consistent structure. In this way any person who will start introducing himself to my thesis will find the structure comfortable to read and to go through different stages.

The first phase – research plan is about researching and collecting data and theoretical background how to create portal based on ServiceNow platform. The method that I'm going to use is searching information using ServiceNow wiki information webpage. It consists a lot of articles about portal creation which can be deployed in my development.

The second stage – development plan is list according to which the development will be implemented. Development plan also consists several intermediate stages. The first stage is analyzing the requirements of the portal which functions will be implemented. The list of requirements is based on the idea to learn all the main abilities of portal such as in-build iframes, static content, dynamic content, view lists, etc. The next stage is graphical vision of the portal, e.g. colors, fonts, layout. The design will be implemented based on my own vision of modern design and UI. The final stages are implementation and testing the portal.

4 Developing the portal used for the research

In this paragraph I'm going to go through all steps of my research and development stages, and explain in details what I was doing to get such result and finally what product I got.

4.1 Research and theory of building portals

I have started my work from investigation of ServiceNow wiki page, which gives big variety of different articles, related to ServiceNow theory and practice. I have found couple of article about portal creation, tutorial about creation of Knowledge portal (test portal), case study about building a website, using ServiceNow CMS and so on.

After precise and concentrated studying of several articles I understood from where I should start my work. And the first stage came itself – requirements

4.2 Analyzing requirements

Due to my creation of portal was related to studying purposes, I have to put in the list of requirements all basic functions that are often used in portal creation. For example, my portal should contain static blocks, dynamic blocks and iframes, all these components are the most used.

About layout, colors and fonts, I didn't have any strict rules how my portal should look like, so the design of the portal is my own vision and decision how it should look like.

The portal contains minimum functionality: on the front page there are 4 dynamic blocks with the description of imaginary company TAN Holding Oy; navigation contains 3 links to another pages which are careers, incidents and contacts. The career page functionality is search of new available positions; the incident page functionality is in-built iframe, which gives availability to view list of incidents and create a new one; and the contact page functionality is for contacting purposes.

4.3 Implementation stage

After going through theory and analyzing the requirements I have started the designing part of the project. First of all, let's go through the application and modules that are used for site creation.

4.3.1 Content management application

The portals or websites are developed using Content Management application that contains in ServiceNow navigation. The Content Management app is CMS (Content Management System) of ServiceNow, using for creation custom interfaces for websites, portals and applications. Content Management includes a lot of modules that are utilized during the development process (Figure 5).
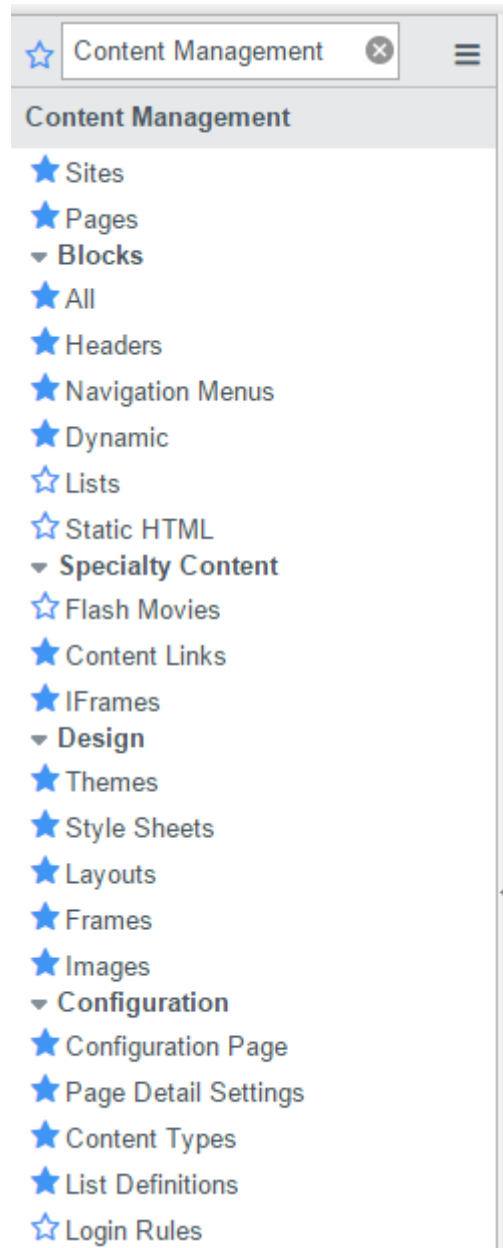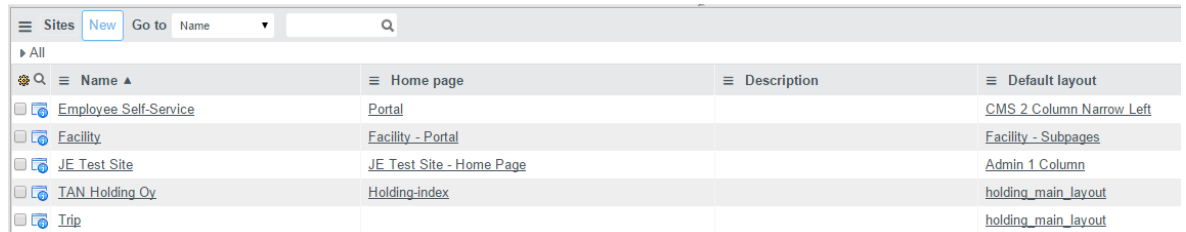

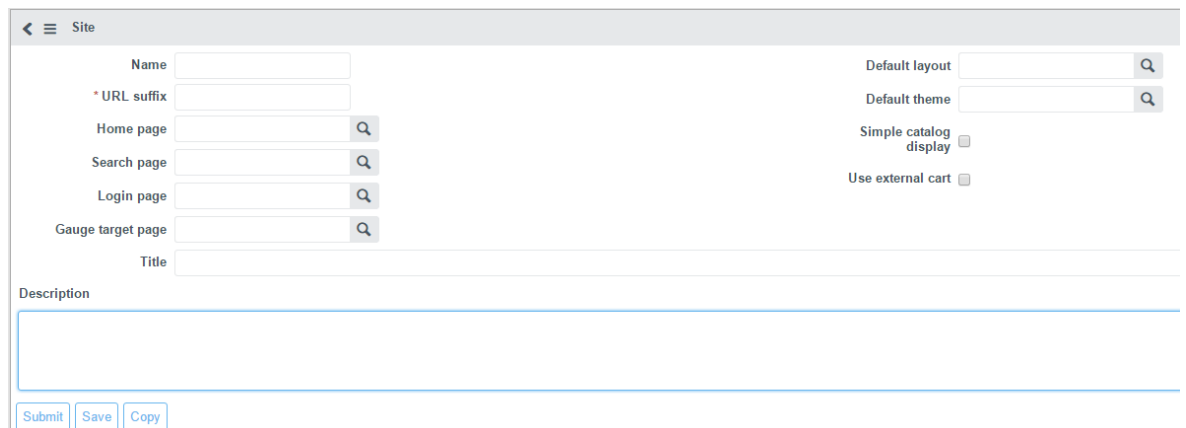Figure 5 Content Management application in ServiceNow

4.3.2 Sites module

The module that I opened first was "Sites" module, it contains list of sites that have already been created (Figure 6)

Figure 6 List of sites under "Sites" module

On the top of the list there is a button "New", which opens a form for site creation (Figure 7). In the form I filled all the necessary, information and press the button "Submit". I left the fields "Home page", "Default layout" and "Default theme" blanked, because those are not ready yet. Now I can start to develop my website.

Figure 7 A form for new site creation

4.3.3 Layouts module

As you remember at the moment of my site creation I didn't have a layout of site. So now, I go to the "Layout module". There, as well as in every module of ServiceNow we can see a list of layouts that were created earlier and the button "New" above the list. I have created the layout for my future portal which consists of 3 drop-zones: header – dropzone0, content – dropzone20 and footer – dropzone40. There is also div wrapper for

whole page. Now, the layout for the portal is ready and I can add it to the site form in the "Default layout" field.

4.3.4 Pages module

The "Pages" module consists of the list of pages that were created earlier and on the top of the list there is "New" button for creation new page. In the Page form creation (Figure 8), besides name and suffix, I need to choose the Layout for the page and Content theme. It is optional to create separate layout for different pages, but I used the same layout for whole site and all pages. As you can see for the form some fields are referenced to another tables, and it is possible to type into this field or to press the search icon and whole list for certain field will be available. In this way I have created 4 pages for my website and now it is time to put something inside of them. When the front page is created I can also add it to the site form.
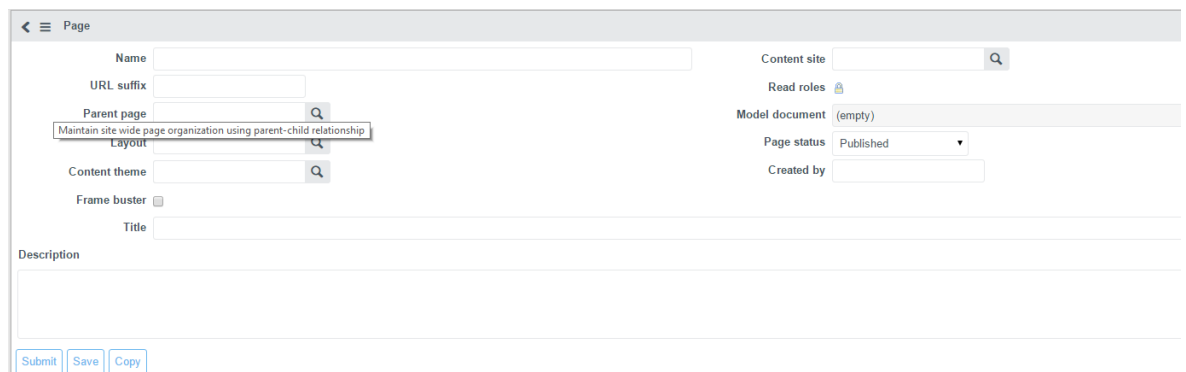

Figure 8 A form for creation a new page

When the page form is filled and saved at the bottom of the form we can see "Related Links" – Edit Page and View Page. To add new blocks to the page "Edit Page" link should be pressed. After that a new form appears (Figure 9) which displays the possible drop-zones where blocks, iframes or images can be added. To add some content, there is a link ""Add content" which opens list of possible blocks that can be added, under the list is the drop-zones, that were created in layout and that are available on the current page.
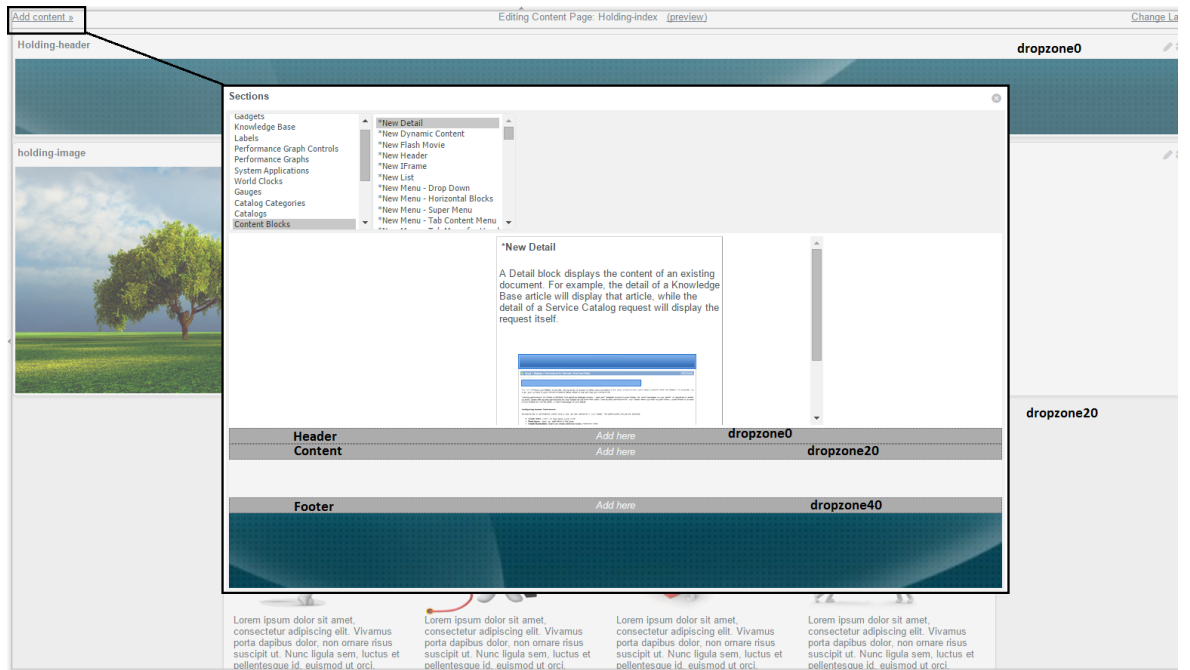
Figure 9. Editing Content Page – Holding-index

4.3.5   Blocks module for filling content of pages

After the page structure is done and pages are created it is time to create blocks that will be put on the pages. For this task I will you Block module, which consists of several submodules: All, Headers, Navigation Menus, Dynamic, Lists and Static HTML.

4.3.6   Headers module

I have started from "Headers" submodule to create a header for my portal. The same as everywhere I pressed on "Headers" module, there is a list of other headers and a button "New" for new header. In the form for new header (Figure 10) it is possible to add a background for the header, logo, text which will be positioned near the logo, also some in-built functions like Search, Font sizer and Login could turned on. For the header of my portal I put background color, Login function and as a login I have used a text which contains a link to the home page of the site.
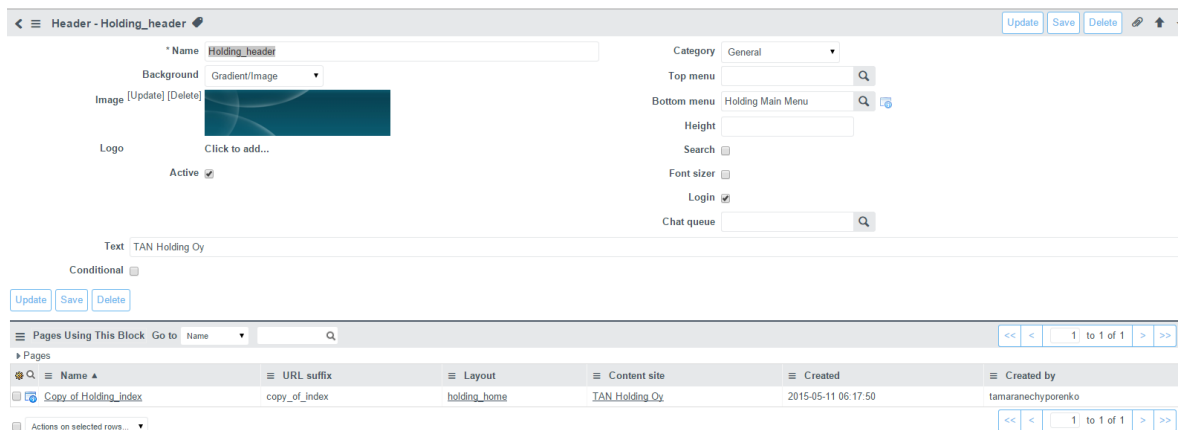
Figure 10 Header of the portal TAN Holding

4.3.7 Static HTML module for footer

For the footer I have created static block (Figure 11) using "Static HTML" module. The procedure is quite similar as with header, the main difference that footer not just ticking check boxes and putting names, but adding text, pictures and links into Static content box.
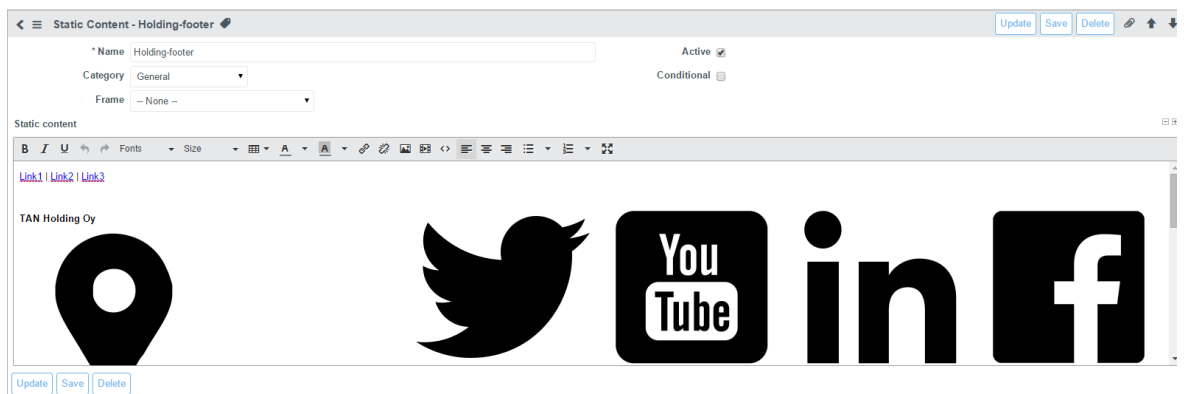
Figure 11 Static content block – footer

4.3.8 Dynamic module for navigation, front content and careers content

All the basic parts such as header, footer and menu navigation for the portal are ready so I can start to create content of each page. A dynamic block is created using Jelly syntax and JavaScript or jQuery. "Jelly syntax is used to render forms, lists, UI pages and many other things rendered in ServiceNow" (ServiceNow Product Documentation. Extensions to Jelly Syntax). I have created 3 dynamic blocks: one for the front page content, another one for the careers page content and one more for menu navigation.

On the front page I have created four blocks which are extending when the mouse is on block (Figure 12). It was implemented using jQuery script.

```xml
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">

<script>
$j(document).ready(function(){
    $j('.level2').on('mouseover',function(){
        $j(this).children('.hide').show();
        $j(this).children('a').hide();
    }).on('mouseout',function(){
        $j(this).children('.hide').hide();
        $j(this).children('a').show();
    });
});
</script>

<div class="level1">
<div class="level2">
<h2>Who We Are</h2>
<img src="who_we_are.png"></img>
<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus porta dapibus dolor, non o:
sapien erat. Proin lorem ligula, pulvinar sit amet odio ut, vestibulum dictum metus. Nulla fac:
<p class="hide">Vestibulum in sapien erat. Proin lorem ligula, pulvinar sit amet odio ut, vest:
a porta pulvinar, gravida quis diam. Aliquam sit amet volutpat eros. Fusce viverra mauris est,
<a href="#">Read more</a>
```

Figure 12 Dynamic block front page content

The next dynamic block is navigation menu. I did not use Navigation Menus module, because it creates a static block, but I need to add more dynamic into navigation (Figure 13). The dynamic that I needed is adding an "active" class to the menu link when mouse is on, or when it is clicked and the pages is opened, so a user can see highlighted menu link which shows the page on which the user is now.

```xml
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
<script>
$j(document).ready(function(){
    var url = window.location.href;
  // Will only work if string in href matches with location
  $j('.menu a[href="'+ url +'"]').addClass('active');

  // Will also work for relative and absolute hrefs
  $j('.menu ul li a').filter(function() {
    return this.href == url;
  }).addClass('active');
});
</script>
<div id="header">
<div id="header_center">
 <div id="logo">
  <a href="https://symfonidemose.service-now.com/holding/index">TAN Holding Oy</a>
 </div>
 <div class="menu">
  <ul>
   <li><a href="https://symfonidemose.service-now.com/holding/careers">CAREERS</a></li>
   <li><a href="https://symfonidemose.service-now.com/holding/incidents">INCIDENTS</a></li>
   <li><a href="https://symfonidemose.service-now.com/holding/contact-us">CONTACT US</a></li>
   <li><a href="#">MENU ITEM1</a></li>
  </ul>
 </div>
</div>
</div>
</j:jelly>
```

Figure 13 Dynamic block navigation menu

And the last dynamic block is on the careers page I have created a list of available positions, and it is possible to sort this list by department and by location using drop-down lists (Figure 14). The functionality of this dynamic block is also implemented using jQuery script.

```xml
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">

<script>
$j(document).ready(function(){
 $j("#department").change(function () {
  $j("#career_list").find("tr.row").hide().filter("." + $j(this).val()).show();
  $j("#location").val('selected');
  if($j(this).val()=='selected')
  {
   $j("#career_list").find("tr").show();
  }
 });

$j("#location").change(function () {
  $j("#career_list").find("tr.row").hide().filter("." + $j(this).val()).show();
  $j("#department").val('selected');
  if($j(this).val()=='selected')
  {
   $j("#career_list").find("tr").show();
  }
 });
});
</script>



<table id="career_list">
 <tr id="title">
  <th>
  </th>
  <th>
    <select id="department">
            <option selected="selected" value="selected">Select a department</option>
            <option name="department" value="customer_success">Customer Success</option>
            <option name="department" value="design">Design</option>
            <option name="department" value="development">Development</option>
            <option name="department" value="engineering">Engineering</option>
            <option name="department" value="project_management">Project Management</option>
        </select>
```

Figure 14 Dynamic block for navigation menu

4.3.9   Iframes module for incident's list and Google map

I have used iframes module to insert incident's list on the page Incidents and to insert a map on the page Contac us. It is very easy to create iframes, using Iframes module. I just went to Iframes module, pressed "New" button. In the form that appeared (Figure 15) I put the name, size and URL of what should be displayed in the iframe block.

Figure 15 Iframes form for creating Holding incidents iframe

4.3.10 Putting ready blocks into the pages

When all the required blocks are created I can open each page form, on the bottom there is a link "Edit page". I can edit page by adding content (blocks) which has already been created. In this way I put all the blocks on their places depending on the "dropzones" in layout in the pages. So now almost everything ready.

4.3.11 Themes module and CSS

As you remember I have one filed that is still blank in the site form - "Default theme". I go to the Themes module, click on "New" button and create a new theme for my portal. When I submit the new theme on the bottom of the form there is Style Sheet list, where I can add new style sheet for each page or for whole portal. So in my case I have created on css file for whole portal and 4 css files for each page.

5   Evaluation and Conclusions

As a result I got fully functional portal that was created based on ServiceNow platform and ServiceNow CMS. I implemented all basic functionalities into the portal and each of those functionalities works well as it should be according to the requirements. Of course a lot more functionalities could be implemented in this portal such as login function, search box, a page where a user can describe some problem and create based on that problem some help request and so on. This list can go into infinity.

The goal is reached and the portal is ready now, so it can be used to try the abilities of ServiceNow platform and CMS. I've tested the validity of the results, everything is working as it was planning and putting into requirements. Dynamic blocks are working as they should be, jQuery was implemented correctly. The portal is looks more as a basic version, but still it shows more frequently used functions.

The sources I was using were very convenient and easy to understand and get all the important information and analyze it later for the research and development. Most of the sources are from official ServiceNow pages, the rest of sources are from Google search. There is maybe one disadvantage of the sources for topic of my thesis, there are very few sources about ServiceNow, and for me as for developer it looks a bit strange because for more than 10 years of existence ServiceNow should have more communities and web pages with useful information about it.

The methods I used for the thesis projects were research methods such as theoretical research for covering theory framework part to describe the phenomenon of thesis project. Also, I used a bit quantitative method and put some data information into theoretical part to have some real numbers and through analyzing them, understand a basic picture of ServiceNow and cloud service. On the opposite site of theoretical research I have been using practical research to create a portal and investigate in practically to get an idea of how the portal works and what functions and abilities it can provide.

The tools that were used in the thesis are Google Chrome web browser and Internet for searching materials and getting an access to ServiceNow Automation Servcie, Microsoft Office 2013 for actual writing of thesis and the last one – ServiceNow Automation Service and ServiceNow CMS for the development of the portal. HTML was used for layout creation of the portal, dynamical parts were implemented using JavaScript and jQuery. Style of portal was created by CSS.

The project management went well throughout the whole thesis work. Everything went stage by stage as it was planned and noted in development plane. The process was split into several steps for easier execution. After finishing one stage, next one was started automatically. During the implementation stage I had some difficulties with jQuery and JavaScript, so it took more time than I expected, but I can control the time I've spent overall and used prioritizing methodos.

After finalizing my thesis project I realized that I got a lot of knowledge related to ServiceNow and cloud services. The basics of ITIL were also covered in university so I just make my knowledge deeper in this area. One of the most important skills that I have received after I finished my thesis – is ability to create portals using ServiceNow platform and ServiceNow CMS. Also, I developed a bit my JavaScript and jQuery skills, by creating dynamic blocks in the portal.

6 Summary

I have gone through theoretical part of ServiceNow platform, describing it from different points of view: definitions, structure, trends, usability, advantages and so on. The areas related to ServiceNow were discussed and explained. Those areas are cloud service and ITIL framework. In the theoretical part I gave some numbers and statistics to see how these technologies are going to be developed in the near future and what we – software users and regular computer users, should wait and on what we should be concentrated now.

As a result of my work I have developed a portal for imaginary company TAN Holding Oy. This portal contains of dynamic and static blocks, iframes and in-build functionalities of ServiceNow. The aim of the thesis was reached and I got an understanding of how to build a portal and what functions are possible to be implemented in the portal, how it can be useful.

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