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### Service Now: CMDB Research

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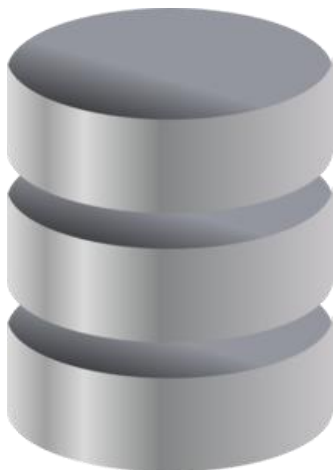
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CLARK  
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**MAPFRE**

**ServiceNow CMDB  
Assessment Capstone**



**MAPFRE ServiceNow CMDB Research**

Monika Patel, Smita Patil, Katerina Tzanavara, Manish Chauhan

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## **ABSTRACT**

The MAPFRE Capstone team has been tasked with reviewing and recommending roadmap on the existing CMDB configuration. Paper discusses the team's overall research on ServiceNow CMDB, Client's deliverables and introduction to the latest technological innovations. Based on given objectives and team's analysis we have recommended key solutions for the client to better understand the IT environment areas of business service impact, asset management, compliance, and configuration management. In addition, our research has covered all the majority of the technical and functional areas to provide greater visibility and insight into existing CMDB and IT environment.

### **ACKNOWLEDGEMENT**

The MAPFRE Research Team wishes to thank our Advisor Richard Aroian and our client Dean Cascione, Business Analyst Sr, Architecture & Integration, for providing direction and assistance to us during our project.

We also wish to thank the following generous people of MAPFRE Insurance for their time and effort helping us with our research: Spetseris Angelos, Vice President Production Systems IT, Helen Loveless – Coburn, Sr Systems Programmer, Michel Jasmin, Sr Manager Infrastructure Technology, Julie Jaynes, Manager Server and Storage, Rob Wells, Manager, IT Service Desk, and Jeff Brunsell, Sr Manager Info Security.

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# INTRODUCTION

## Executive Summary

The MAPFRE Insurance is the largest insurance service provider originated in Webster, Massachusetts in 1972. The company was founded to provide independent agents access to a company focused on agents and their customers' personal lines insurance needs. Our capstone project is aimed to provide recommendations in areas where the CMDB is incomplete, or in concern or risks, and including near- medium and long-term roadmap considerations. In order to deliver and complete the objectives we all met regularly and set goals for ourselves at different stages during the project. In addition, we all got the opportunity to visit the MAPFRE Insurance, Webster location to discuss the project deliverables. In the onsite meeting, we discussed their existing business model, architecture and the existing CMDB configuration in the production environment.

This project was originally intended to review and roadmap recommendations on the existing CMDB configuration, utilization, and data model. In addition to reviewing the current CMDB environment, to provide an overview of industry standards, best practices, and proven methodologies taking into account the current state of the MAPFRE ServiceNow CMDB. Through this project and our team research not only have we identified numerous key issues covering technological as well as functional areas of the ServiceNow CMDB, but we have also recommended best possible solutions for those areas for a long run.

According to our findings, the CMDB health dashboard displays incompleteness and concerns. Analytically, there are duplicate Configuration Items (CIs), Orphan CIs, and Stale CIs, that eliminate the proper view of the CMDB dashboard. We recommend several methods and tools available in Now Platform to ensure the CIs are populated accurately and improve the CMDB

health metrics, completeness, compliance, and correctness. In addition, we suggest best practices, like the IT Infrastructure Library, that enables the relationship between the CIs is properly linked so that business operations are tracked accordingly.

While CMDB software will help MAPFRE Insurance map out their IT and service ecosystem, it is important to recommend also an additional layer of intelligence, one which uses supervised machine learning to automate prediction of fields like category and assignment group for incidents and cases. This type of tools, native to Now platform, allows configuration and easy deployment of machine learning solutions by business users rather than requiring specialized data scientists to operationalize this.

As it concerns data security, we recommend ServiceNow Incident and Vulnerability Response which will help MAPFRE respond faster and more correctly to vulnerabilities, join safety and IT teams, and furnish real-time visibility.

## **Background Information**

MAPFRE Insurance originated in Massachusetts as The Commerce Group, Inc. (CGI), founded in the town of Webster, Massachusetts in 1972. It is the largest private passenger automobile insurer, homeowners' insurer and commercial automobile insurer in Massachusetts. It offers property and casualty insurance in 19 states across the United States through a network of more than 4,200 independent agents and brokers. It is rated "A" (Excellent) by A.M. Best Company.

"That's MAPFRE... People who take care of people."

MAPFRE Insurance provides a full range of insurance products, including coverage for automobiles, homes, motorcycles, watercraft and businesses. MAPFRE Insurance is part of the MAPFRE Group, a global insurance company present on five continents. It is the benchmark insurer in the Spanish market, the leading multinational insurance group in Latin America and one of the top 10 insurance companies in Europe in terms of premium volume. MAPFRE employs more than 38,000 professionals and services approximately 34 million clients.

### **MAPFRE Insurance**

- Has offered a wide range of insurance solutions for both home and vehicle owners since 1972
- Is the 19th largest writer of private passenger auto insurance in the United States
- Distributes products through a network of more than 4,200 independent agents and brokers
- Has branch offices and association agreements across the United States

## **Vision**

To be the most trusted global insurance company.

**Mission**

They are a multinational team that works to constantly improve their services and develop the best relationship with their clients, distributors, suppliers, shareholders and society at large.

**Values**

- Solvency
- Integrity
- Commitment to service
- Innovation for leadership
- Committed team

**Configuration Management Database (CMDB)**

A configuration management database (CMDB) is a database that contains all relevant information about the hardware and software components used in an organization's IT services and the relationships between those components. A CMDB provides an organized view of configuration data and a means of examining that data from any desired perspective.

How CMDBs work and why they're important

As IT infrastructure becomes more complex, the importance of tracking and understanding the information within the IT environment increases. The use of CMDBs is a best practice for IT leaders that need to identify and verify each component of their infrastructure to better manage and improve it.

Within the context of a CMDB, components of an information system are referred to as configuration items (CI). A CI can be any conceivable IT component, including software,

hardware, documentation and personnel, as well as any combination of them or dependencies between them. The processes of configuration management seek to specify, control and track CIs and any changes made to them in a comprehensive and systematic fashion.

CMDBs capture attributes of the CIs, including CI importance, CI ownership and CI identification code. A CMDB also provides details about the relationships (dependencies) between CIs, which is a powerful tool if used correctly. As a business enters more CIs into the system, the CMDB becomes a stronger resource to predict changes within the organization. For example, if an outage occurs, IT can understand through the CI data who or which systems will be affected.

### **The digital transformation challenge**

Digital transformation demands fundamental business changes to achieve operational agility and efficiency, much of which includes the automation of countless processes. Most organizations rely on application development to facilitate this automation but are challenged by a lack of resources and increasing backlog. The solution is a strategic application platform that democratizes development and enables everyone to build apps that automate processes across the enterprise.

### **The ServiceNow solution**

The Now Platform enables enterprises to quickly build powerful apps with seamless connectivity across people and processes—delivering unique business solutions for employees and customers. Across industries, organizations of all sizes are accelerating automation, supercharging their apps with in-platform intelligence, and future proofing their IT investments by leveraging an ecosystem of innovation from ServiceNow and our partners.

- Automate even the most unstructured workflows across virtually any platform, app, or data set and between any people-to-people, people-to-system, or system-to-system interactions.
  - Leverage contextual data from activities, tasks, and processes within a common data model that can be leveraged by any app or service.
  - Integrate with any application, service, or data using a natural language framework so experienced developers can provide non-IT developers with a library of reusable connectors.
  - Power greater automation and selfservice delivery with in-platform intelligence that leverages machine learning, virtual agents, and data analytics to guide and drive action.
  - No-code to pro-code skills sets alike can build on a leading aPaaS to deliver apps faster with open web standards, languages, and frameworks to develop new apps or enhance and extend existing apps.

## Discovery

Discovery finds computers, servers, printers, a variety of IP-enabled devices, and the applications that run on them. It can then update the CIs in your CMDB with the data it collects.

There are two types of discovery:

- Horizontal discovery

Horizontal discovery is a technique that Discovery uses to scan your network, find computers and devices, and then populate the CMDB with the CIs it finds. Horizontal discovery does create direct relationships between CIs, such as a runs on relationship between an application CI and the actual computer CI that it runs on.

Horizontal discovery is not aware of business services and does not create relationships between CIs based on the business service they are in.

- **Top-down discovery**

Top-down discovery is a technique that Service Mapping uses to find and maps CIs that are part of business services, such as an email service. For example, top-down discovery can map a website business service by showing the relationships between an Apache Tomcat web server service, a Windows server, and the MSSQL database that stores the data for the business service.

Typically, Service Mapping and Discovery work together to run horizontal discovery first to find CIs, and then top-down discovery to establish the relationships between business services that you need to know.

Discovery uses these components to find CIs:

### **Probes and sensors**

Basically, probes and sensors are scripts that collect and process data on a host and then update the CMDB. More specifically, probes explore or investigate CIs on your network, and sensors parse the data returned from the probes. Several probes and sensors are provided by default, but you can customize them to find different information, or you can create ones. You can also configure several parameters to control the behavior of a particular probe every time it is triggered.

**Patterns**

Patterns, like probes and sensors, are a series of operations that also collect data on a host, process it, and update the CMDB. Patterns differ from probes and sensors in that they are written in Neebula Discovery Language (NDL) rather than JavaScript, and they are called into action in the later stages of the horizontal discovery process. Default patterns are provided, but you can also customize or create patterns using the Pattern Designer.



## Statement of the Problem

Insurance sector is evolving — and evolving fast. Despite some cultural resistance and regulatory issues, adoption of IT tools and applications is at an all-time high, generally because startups are defining new strategies and whole new business policies with technologies growing at a rapid pace. Technological advancements such as Artificial Intelligence (AI), Machine learning big data analytics, predictive analysis and prescriptive analysis is completely transforming the Insurance industry and other sectors to get an edge in the market.

Customers have started applying and monitoring their applications using digital tools. The companies have reduced the application processing times to 15-20 minutes from 1-2 weeks using digitization and modern techniques.

So, the question is what insurance industry can do to optimize the advanced technologies like advanced analytics, AI, or blockchain and wearables, amongst other disruptive technologies? The first step is to understand the goal and strategies of the digital transformation effort. This requires knowledge in enterprise process administration and enterprise data modeling to the extent that traditional and modern tactics can be simulated against a set of measurable metrics. With the amount of load your CMDB will carry, you need to make sure it's built to sustain the whole thing that relies on it. Remediation tasks can leverage automation assist deliver efficiency, overall cost savings, and compliance to CMDB and to the company, so it makes sense to leverage this product as a base for your compliance applications.

Comparing the compliance's performance against peers with the ServiceNow Benchmarks application organization can determine where they stand. Using the comparative data available in ServiceNow's Benchmarks will also keep your CMDB in compliance with ServiceNow CMDB Health Compliance requirements.

When we talk about the completeness and integrity of the CMDB, remember an incomplete or inaccurate CMDB can have a significant impact on the other ServiceNow applications. Whenever an incident is created or modified, your database will pull from a specific Configuration Item (CI). It is important to ensure integrity and completeness of the CMDB data and it shall be constantly maintained so that any missing or incomplete information entered under CI, doesn't inadvertently alter others.

This represents the statement of the problem for the Mapfre Insurance Capstone Project. To fulfill mission and vision values it is important for MAPFRE Insurance to adapt and think about the recommendations provided in this report on given objectives.

**Purpose of the Capstone**

The purpose of this project is to give MAPFRE Insurance recommendations for the MAPFRE ServiceNow CMDB Assessment. MAPFRE Research Team came to these recommendations through the research and analysis of the existing data sources, environment, and processes. In addition, MAPFRE Research Team provides an overview of industry standards, best practices, and proven methodologies taking into consideration the current state of the MAPFRE ServiceNow CMDB. The Team analyzes:

- Solution architecture and integrations
- Errors, inconsistencies and/or inefficiencies
- Planned roadmap for CMDB maturity

Through this assessment, the MAPFRE Research Team showcases areas where the CMDB is incomplete, or in concern or risks, and provides recommendations on CMDB improvement.

## **Significance of the Capstone**

### **For Students:**

This capstone project has provided students with an opportunity to solve real world problems. It will equip students with skills, efforts, and knowledge required in the real world. It allows students to learn:

- How to communicate with team members as well as other stakeholders
- How to approach a real-world problem
- How to collaborate in team
- How to follow through with responsibilities
- How to adhere to deadlines
- How to network with various people in the field of study
- How to conduct interviews and conference calls
- How to conduct research
- How to gather and analyze data
- How to recommend the most appropriate solution

### **For the Client:**

This capstone project is beneficial to the client (MAPFRE Insurance) because the final product of this project is the final report that contains the following information:

- Detailed review of existing data sources and processes for populating the Configuration Management Database (CMDB).
- Review of CMDB Health Dashboard configuration and utilization.
- Recommendations on CMDB design and data model.

- Recommendations on managing data flow into and within the CMDB.
- Recommendations on CMDB roadmap taking into consideration existing data sources.
- Recommendations for ServiceNow capabilities and industry best practices.

The next chapter is about the trends in the industry. It thoroughly explains the uses of latest technology and how it improves the capabilities and processes of CMDB.

## TRENDS IN THE INDUSTRY

The broadest possible definition of ServiceNow’s business model is that the company creates customizable productivity tools that are flexible enough to serve a wide range of business needs. In its earliest days, ServiceNow targeted help desks and IT service management providers as primary customers. In a brief amount of time, they have expanded their offerings to include an enterprise cloud solution that can be tailored to address a variety of corporate IT concerns.

The Service Now Platform delivers a system of action for the enterprise. Using a single data model, it makes it easy to create contextual workflows and automate business processes.

In the following paragraphs are described some of the trends that are impacting the ServiceNow industry today with the Cloud services - IT (Service Management, Operations Management, Business Management), Software Asset Management, Security, Customer Service Management, HR, Business Apps, Now Platform and Nonstop Cloud features.



## **Cloud Services**

### **IT Service Management**

ServiceNow IT Service Management (ITSM) provides a modern service management solution in the cloud. Our single system of action allows you to consolidate tools, transform the way you deliver services and improve customer experience. With ServiceNow ITSM, you can automate workflows, gain real-time visibility, and improve IT productivity, allowing you to switch your operational investments to innovation.

With ServiceNow ITSM, you can accelerate your digital transformation and elevate your service experience by providing consistent end-user services anytime, anywhere, and through any channel, using virtual agents.

### **IT Operations Management**

Service Now IT Operations Management solutions help your organization enhance visibility into its infrastructure and services, prevent service outages, and maximize operational agility.

Depending on the needs of your organization, you can deploy one of the following IT Operations Management solutions: Standard, Professional and Enterprise.

### **IT Business Management**

IT Business Management offerings help you better manage demand, balance resources, manage agile and waterfall projects, perform budget planning, and map costs to technical and business services. IT runs more like a business unit and aligns better with the rest of the organization.

## **Security**

### **Security Operations**

Bring incident data from your security tools into a structured response engine that uses intelligent workflows, automation, and a deep connection with IT to prioritize and resolve threats based on the impact they pose to your organization with Security Incident Response, Vulnerability Response, Configuration Compliance, Threat Intelligence and Trusted Security Circles.

### **Governance, Risk and Compliance**

Governance, Risk, and Compliance (GRC) is the methodology created to manage the strict and complex regulatory and industry requirements across corporate environments. The ServiceNow® GRC suite contains four main applications: Policy and Compliance Management, Risk Management, Audit Management, and Vendor Risk Management.

### **Software Asset Management**

The ServiceNow Software Asset Management (SAM) application systematically tracks, evaluates, and manages software licenses, compliance, and optimization. You can reclaim unused software rights, purchase new software rights, and manage allocations for entitlements. Software Asset Management solutions help your organization manage software assets and compliance



## **Customer Service Management**

Use the Customer Service Management (CSM) applications to provide your customers with multiple methods of engagement and collaboration, omni-channel communication, product knowledge and notifications, quick response to questions and issues, and efficient case resolution.

## **HR Service Delivery**

The ServiceNow® HR Service Delivery application improves the employee service experience by automating HR interactions and providing a single platform for all HR services.

## **Business Apps**

ServiceNow provides a single mobile and web application development platform to quickly build business applications that power your digital transformation.

## **ServiceNow Platform**

### **Agent Intelligence**

The ServiceNow® Agent Intelligence product enables you to use machine-learning algorithms to set field values during record creation, such as setting the incident category based on the short description. You can train predictive models, so they act as an agent to automatically categorize and route work based on your past record-handling experience.

### **Service Portal**

Service Portal is a portal framework that allows administrators to build a mobile-friendly self-service experience for users. It interacts with parts of the ServiceNow platform, so users can

access specific platform features using Service Portal. It is an alternative to the Content Management System (CMS) based on more modern technologies.

### **Subscription Management**

With the ServiceNow® Subscription Management application, review and manage how your ServiceNow subscriptions are used on your production instance. Subscriptions are downloaded to production instances only and not to development or QA instances.

### **Knowledge Base**

The ServiceNow® Knowledge Management (KM) application enables the sharing of information in knowledge bases. These knowledge bases contain articles that provide users with information such as self-help, troubleshooting, and task resolution.

### **Workflow**

Workflow provides a drag-and-drop interface for automating multi-step processes across the platform. Each workflow consists of a sequence of activities, such as generating records, notifying users of pending approvals, or running scripts. The graphical Workflow Editor represents workflows visually as a type of flowchart. It shows activities as boxes labeled with information about that activity and transitions from one activity to the next as lines connecting the boxes.

### **Configuration Management Database (CMDB)**

With the ServiceNow® Configuration Management Database (CMDB) application, build logical representations of assets, services, and the relationships between them that comprise the

infrastructure of your organization. Details about these components are stored in the configuration management database (CMDB) which you can use to monitor the infrastructure, helping ensure integrity, stability, and continuous service operation.

### **Interaction Management**

Interactions are a centralized location for all communication channels in the platform. Each interaction represents a request for assistance through a given channel, for example, a call or a chat. Use interactions to route to queues for assignment or assign them to agents directly. Associate related records with an interaction to track additional work being done as a result of the interaction.

### **Orchestration**

ServiceNow® Orchestration extends the workflow engine to manage processes and to automate things outside of a ServiceNow instance.

**Nonstop Cloud****Multi- Instance**

The ServiceNow cloud is deployed on an advanced, multi-instance architecture that separates a customer's application nodes and database. This means there is no co-mingling of customer data and lets you fully customize your cloud services and perform upgrades on your own schedule.

**Scalable**

ServiceNow has the ability to scale beyond ticketing to include contract and project management modules to further support one single operation for administration.

## METHODS

### Design

After obtaining the evaluation requirements of the Service Now configuration management database given by MAPFRE to our team, we first searched the existing mature CMDB system and explored the successful model of CMDB system. According to the company's requirements, such as review existing data sources and processes for populating the CMDB, provide recommendations on CMDB design and data model, provide recommendations for Service Now capabilities and industry best practices, we search for the relevant content of the mature CMDB system. Our group went to MAPFRE for the first meeting, during which IT department managers and other members introduced their demands and the status quo of ServiceNow. Because MAPFRE is a large company with tens of thousands of employees and countless customer information, the establishment of this CMDB system is a big project. Customers expressed the hope that we could look at the problem from an external perspective, perhaps to give some inspiration to IT personnel. In fact, customers already have a very good team to build this CMDB system, and use the ServiceNow template. Customers want us to evaluate the system from our own point of view. So we started the analysis according to the customer's requirements.

In the sixth week of the project, we can use the demo of the system to really understand the CMDB system that MAPFRE wants. After a videoconference in which customer team members introduced their CMDB system they were building, our group discussed the questions we wanted to ask ourselves about the system or the project by searching for information. So, in a conference call, we asked some questions, such as who is the main user of the system? What are the main functions that customers want the system to perform? Which is the patch management process you follow? How do you populate the CMDB by using Discovery, by importing information from

another source, by integrating with an existing external CMDB, or by manually creating CIs?

After this meeting, the customer gave us relevant answers. Moreover, we feel that these answers and the use of this system sample can make our analysis process more efficient. After completing our research, the team conducted an analysis and conclusion phase. At this stage, we find that we need to integrate a lot of information.

In further in-depth discovery and learning, when we asked the customer if there were some relevant data, the customer did not answer, so we found that the customer provided six requirements that we cannot fully analyze. So we decided to analyze the following points: review existing data sources and processes for populating the CMDB, review existing asset onboarding, asset retirement, and management processes, provide recommendations on CMDB design and data model, provide recommendations on management data flow into and within the CMDB, review CMDB health dashboard configuration and utilization, provide recommendations on CMDB design and data model, and provide recommendations for capabilities and industry best practices. Because members of the team have different expertise, each person is responsible for different parts. Our goal is to analyze and make suggestions on how to compare the mature and successful CMDB systems in the market with the system samples given by our customers.

The first step in our project design is to collect any information we can get and ask all the questions that confuse us based on the information we have and the system sample provided by our customers. The second step is to decide what we can do and how we can do this analysis. Because this is an evaluation of CMDB system based on cloud computing, our analysis method is single. In the course of our analysis of the respective parts, we established SharePoint to share

their work processes. Similarly, information found in other parts of the team will be exchanged and shared to make the process of the project more efficient.

## **Ethical Concerns**

### **Compliance**

A major part of security and privacy mechanisms are usually as a set of standards. ServiceNow is supposed to comply with several standards with respect to the service providers. Therefore, compliance describes a set of principle that are considered during the development and management of the online cloud system. For example, the ISO/IEC 27108 standard seeks to address the necessary protection of PII (personally Identifiable Information). Therefore, service providers storing data and information for companies are required to follow several principles imposed by the standard.

### **T&C (Terms and Conditions)**

T&C (Terms and Conditions) refers to a set of regulations that serves as a legal contract between a customer and the specific cloud service provider. The T&C determines the rights of all parties involved. In addition, T&C also contains the conditions and penalties involved when one of the parties violates the stipulated rules and regulations. Some providers go against these T&C and hence, this possesses as an ethical concern.

### **Privacy and Security**

Privacy entails the protection of sensitive data that belongs to a client. The ServiceNow administrators generally have access to users' personal files and details for important purposes like troubleshooting and managing the system. This tends to be a liability since it compromises the users' privacy. Apart from this, it is normal that where there is highly secured data, some individuals will always try to breach the information leading to data leakage. Therefore,



the users' trust on the cloud service provider is at risk of eroding. This is because users do not expect any data breaches since the services have been paid for. More so, with ServiceNow, when there is a data breach, the owner may not notice that this is happening. Therefore, if the data falls into the wrong hands, it could be a dangerous situation.

### **Data Breaches**

A cloud computing system such as ServiceNow can attract a high number of hackers to raid on the data stored. The severity of an attack depends on the confidentiality of the information which will be exposed. Financial rewards come with exposing data such as trade secrets, health information and intellectual property of an organization. When data breaches occur, companies are fined, as well as they may encounter some lawsuits and criminal charges.

### **Reputation of the Service Provider**

Whenever a data breach occurs, the service provider should immediately inform the users. However, most companies do not comply with this regulation since they will tarnish the company's image. Therefore, this demonstrates another ethical concern when using cloud computing.

### **Malicious Insiders**

Most information loss happening from inside an association is human error. Malicious insiders exist and are responsible for much of the harm. Those insiders come in the form of contractual workers, past workers or an accomplice who are capable of retrieving an organization's data and uses it in a bad manner. Therefore, this represents how evil insiders are ethical concerns when using ServiceNow.

### **Permanent Data Loss**

Any information loss can cause serious effects to a business or individual. This is primarily due to human mistakes. Therefore, it should be the provider's obligation to fabricate strong server farms. Consequently, providers should set up SLAs (Service Level Agreements) to maximize security. Therefore, this depicts how data loss is an ethical issue when using ServiceNow.

### **Hacked APIs (Application Programming Interfaces)**

APIs are the backbone of cloud computing connections among users. Cloud APIs' IP addresses shows the association between the users and the cloud. Therefore, securing APIs from any unnecessary interruptions is essential to cloud security. A simple assault on an API can lead to massive data leakage.

### **Environment**

This is an easily forgotten stockholder which is affected by the cloud computing. A study carried out in 2007 revealed that the internet and communication technology industry generate roughly 2% of the total global CO2 emission (Mingay, 2007). This is an equal quantity with the aviation industry. Although cloud service providers pay huge amounts of money due to energy consumption, they need to embrace green sources of energy.

## **Data Analysis**

Data analysis is a very important part in the whole process of the completion of the project. How to conduct efficient data analysis is a very important problem need us to solve. CMDB is a huge system with many information and abstract concepts, which means we need to do a lot of extra research. Our team used a variety of data analysis methods to achieve better results.

At the first, we divided the whole project into different parts, with different team members in charge. This can help us be more targeted in data sorting. Because different team members are responsible for different parts, so they will use different methods to collect and analyze data. Throughout the project, there are some common data analysis methods that all members will use. All the data we collect from Official websites, reports, publications and interviews with employees to ensure the authenticity and reliability of data as much as possible. At the same time, the timeliness of these data also is an important aspect what we pay attention to. We hope that all the data we analyzed is correct and we will not make a wrong judgment because of the old and invalid data. At the same time, all team members will carry out keyword search, and keyword analysis. In this way, the interference of meaningless information is reduced.

There are some detailed and specific data analysis processes from different program parts. We can find the similarities and differences of these data analysis methods.

## **CMDB Design**

For the designing we've used the built-in function of chrome to audit the website by its performance, accessibility, best practices and SEO which is done using Lighthouse. It the overall report of which data is useful, and which is not. We've also analyzed the data based on the UX best practices from Don't Make Me Think, Revisited: A Common Sense Approach to Web

Usability by Steve Krug. How a user thinks when they visit the site was the important perspective while analyzing the design.

### **CMDB Data Model**

Because the data model is a very abstract concept, when we do relevant lookups, we start with the basic levels. First of all, each concept should be carefully understood, so that we can understand the meaning of each concept. Next, analyze how many data models there are and what their functions. This needs to be supported by official data, and charts and diagrams will give us a better understanding and help. Next, the functionality of the CMDB system is determined through the analysis of existing models. Those data functions have been implemented and those need to be improved. In the process of data collection, sometimes we can receive some new inspirations. Then we will search for new ideas and determine their feasibility.

### **CMDB Roadmap**

In this part, we compared and reviewed the latest Asset management and data security tools and technologies. In addition, our research and findings were aligned with NIST's cybersecurity framework and ATT&CK Matrix for Enterprise. In addition, we found that for the existing CMDB data sources asset management and risk management is essential in an automated environment integrated with multiple tools and applications. A comprehensive asset management strategy will help MAPFRE to focus and get the best from it by deriving value from organized and unaltered data.

In the research, we have included data security and asset management tools and solutions which can be integrated through API's in ServiceNow and can eliminate vulnerabilities and threats

from the attackers. Moreover, we found that healthcare and insurance companies are using proactive approach focusing on security and access management in order to competitive when researching the latest safeguards and asset management tools.

### **CMDB The Best Practices**

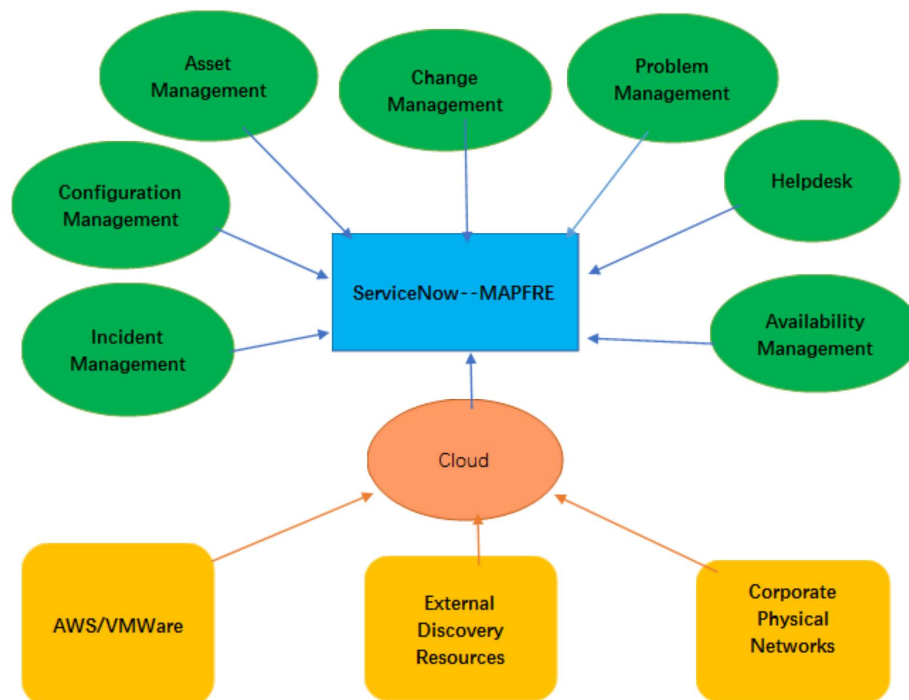
About the best practices in the industry part, we attempted to find any missing core features of the ITIL process and improve CMDB by identifying its strengths and weaknesses. We checked if all the processes are aligned to best practices in the industry, like the ITIL process and the ISO 20000. In addition, we checked the ServiceNow capabilities and if they are exploited efficiently. Then, we consider the recommendations that will help employees take the advantages of the ITIL processes and suggest tips to improve the CMDB. At last, we recorded conclusions and recommendations in a report, and associate interpretations to justify my recommendations and make a positive and efficient impact on the company.

There are some basic analysis steps during this part: First, review all the processes in the CMDB and data. Then, organize comments into similar categories, e.g., concerns, suggestions, strengths, weaknesses, similar experiences, program inputs, recommendations, outputs, outcome indicators, etc. Attempt to identify weaknesses and missing items or processes according to ITIL and ServiceNow capabilities. Then, consider the recommendations to help employees improve the CMDB. Last, record conclusions and recommendations in a report, and associate interpretations to justify our conclusions or recommendations.

## RESULTS AND REFLECTIONS

### Review existing data sources and processes for populating

The basic data structure of a CMDB system comes from problems, changes, events, asset management, service mapping, and cloud management. Since this system is based on cloud computing, there are data sources such as external discovery resources and corporate physical networks. Because the CMDB contains and records data that are also called configuration items, all the CIs in this ServiceNow is the data.



Although there is a large amount of data on hand, the data itself can also be mixed with noise, which may conceal meaningful data behind causality and probability, so more data may not necessarily lead to better decision-making. CMDB supports many processes, including event management, change governance, auditing and compliance, and the help desk. These processes use CMDB to determine the best course of action. Before finding what you need, you usually have to spend time filtering out data quality issues in CMDB.

### **The important of clean data**

A CMDB supports critical roles in an organization, including: IT or Software Asset Management (ITAM/SAM), Service Desk in IT Service Management (ITSM), Licensing Compliance and Enterprise Architecture—planning & governance. These functions depend on CMDB with clean data. To be effective, CMDB requires 97% accuracy. In fact, the average accuracy of data in CMDB is only 50% - 75%. Without clean data, activities cannot be completed. When the data is clean, the data is consistent, authoritative, complete, and up-to-date. There are always several reasons why organizations can have clean data in their CMDB systems, such as IT systems that don't own asset information, multiple sources of confusion, lack of standardization, and vendor-induced complexity.

Because data comes from many sources and represents suppliers and products in many ways, data consistency becomes a serious problem due to the lack of standard data. And the data from this source will be repetitive and conflicting. For a variety of reasons, different inventory and asset management tools may report conflicting or duplicate data. When the problem extends to millions of rows of data, finding and fixing duplications/conflicts can be a daunting task. Studies have shown that 95% of the data collected from various sources of discovery are insignificant. Deleting irrelevant data can significantly reduce data footprint. With the emergence of new devices and software, the network has been changing. With new software versions, patch updates, product names, mergers and acquisitions, and support changes, vendors are constantly changing. A large organization may have hundreds of CI updates per week. As you collect data, the industry is changing, releasing new versions and sending new patches. Organizations usually spend a lot of time and money on the initial setup of CMDB. But then they found that CI changed very frequently. If CI cannot be maintained, data in CMDB will quickly become obsolete.

## **Define the objective**

The first step in doing a CMDB system is to determine the objective. The main body of this project is MAPFRE Insurance Company located in Webster. MAPFRE is an 87-year-old insurance company with subsidiaries in several countries. It operates on all five continents and are the leading insurance provider in the Spanish market, the third largest insurer in Latin America and one of the 10 largest European insurance groups in terms of premium volume.

As an insurance company, there are tens of thousands of company customer information, contracts and programs in hand. Therefore, a good CMDB system is the essential operation software at this time. In the research, the SERVICENOW is designed to quickly input, inquire and change customer information for salesmen, supervisors, distributors, customer service and other staff.

Therefore, we need to start with these problems when we build this system. Current difficulties, bottlenecks, etc. Is it the fuse of this project? - What benefits do you expect? What services will be improved? Who will use CMDB? What kind of information will users search for? What conditions do they have? What are your criteria for success? According to these basic questions, it can be determined that this CMDB system is for the staff of the company to record their own work data, and many kinds of work can be carried out in this system, such as system management, contract management, change management, problem management, content management, investigation, evaluation, workflow recording, administration, team development, etc.

In my opinion, the quickest and best way to determine the main function of the system is to send questionnaires to relevant users. For example, a company salesman may want basic functions such as contract records, tracking, email, process records, reports to facilitate his daily



work. After conducting the questionnaire, you can interview some relevant users, such as staff representatives and supplier representatives, and ask them what they need for the system. After conducting a comprehensive investigation, we can determine the main body and main functions of the system before proceeding to the next step.

Because what we see is only a demo of the system. I think in the first step, I did not do a good job, did not find the main practical functions of users, but listed all the functions that can be used. There are too many catalogs in ServiceNow, which can easily dazzle users. Although it can be directly searched, it is different from other mature CMDB systems. Those systems are simple and clear, with only a few buttons. After clicking on the button, there will be more options, which will bring users a better experience.

### **Assign responsibilities and staff motivation**

Change is uncomfortable in a company, especially in an era of rapid technological development. Everything has to change with the times. This is an era of cloud computing, paper and hardware can no longer meet the data storage in the era of big data. So, MAPFRE now needs a mature cloud computing database to maintain customer data and company information, especially MAPFRE, a company with tens of thousands of customers. A mature IT team is needed to complete the system. After the first step is to identify the main body, team members are to be identified. Teams need to be involved in defining goals related to CMDB projects and dividing projects into phases to deliver significant short-term success. W Clear responsibility. Configuration management must have a process owner. By clearly assigning responsibilities, you can help ensure the success of the project and ensure that CMDB provides strong and accurate

information. Someone should also be responsible for the various information sources of CMDB to ensure the correct implementation and maintenance of the interface.

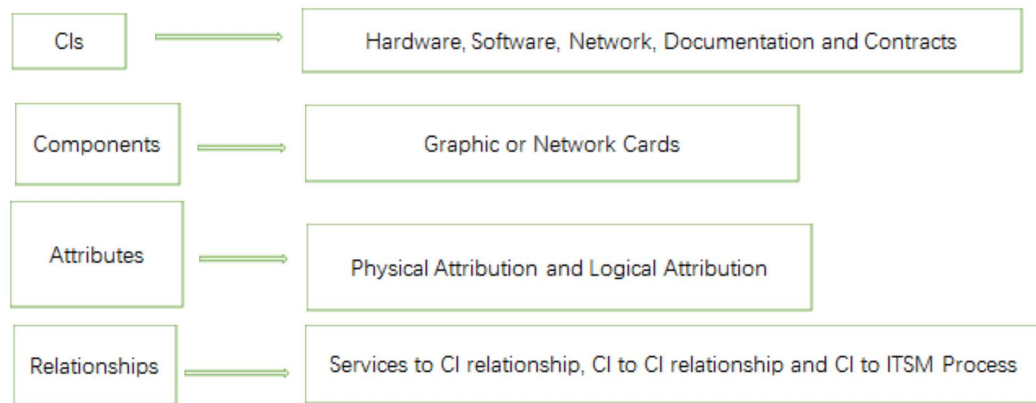
MAPFRE is a large company and has done a good job in team work. The team members include: IT infrastructure administrators (usually described as asset management or inventory management), all process staff in application management, especially event, problem and change managers. And this is an excellent team with rich resources, which is an important part of building a successful CMDB system. Technology and communication are also important factors, as a company with a long history of teamwork is also excellent.

### **Bottom-up or top down: Select the right approach**

Then it's to choose whether to build the system from top to bottom or from bottom to top. According to the large scale of MAPFRE, it is very likely that the top-down approach will be adopted. With a bottom-up approach, you must be careful not to overlook your goals. Instead of recording each configuration item with all configurations, the focus should be on the elements that have the greatest impact on IT service delivery. The scheme is formulated by the superior and executed by the subordinate. Since before the establishment of this CMDB system by MAPFRE, there existed "local CMDB" in the form of MS Excel file and MS Access database, the key to the establishment of CMDB system is to merge and integrate these data and information. The challenge here is to successfully integrate the management of these local community management databases, while meeting the dual goal of providing professional users with sufficient detailed information, without making the database too large and clumsy to be an effective tool.

## Define the CMDB content

After the preliminary preparation, it's time to consider what information is needed to define the success of the system and what CIs are needed to achieve the required requirements. The content of CMDB system includes Configuration Items, components, attributes and relationships.



Enterprise policy is the action guideline and common program of enterprise management. It unifies enterprise's understanding, reduces unnecessary communication cost, and makes enterprise more effective in process execution. For the construction of CMDB, there are two main types of policies that need to be focused on. **Macroscopic Policy:** It mainly involves the guiding and directional policies at the IT Department level. Its goal is to form a unified understanding from top to bottom in the IT department, which is conducive to the success of the project. **Operational Policy:** It mainly involves process objectives, personnel, input, output, activities, KPI and other elements, as well as the guiding principles of process coordination and information exchange. Its goal is to enable the process to be implemented steadily and effectively under the guidance of policy. Then, the breadth, depth and life cycle of CI should be determined according to the needs of enterprise IT services, the level of enterprise IT service management and the cost of enterprise CMDB operation and management. The next step is to build a user-friendly CI model to classify and determine the attributes of CI items. An important step is to define the relationship between

CI items. All configuration items have significance, and the internal relationship between them is one of the important values of CMDB. The relationship is clear. Operating and maintenance personnel can accurately find the relevant entity resources. When a fault occurs, they can quickly locate the source of the fault and its impact scope, thus quickly solve various hidden dangers.

CI is IT infrastructure, used to support services. Personal computers, printers, Cables, and application systems are all part of CI. After the CMDB system is put into use, these items will be connected to the new system to integrate and synchronize information. Components are designed to simplify maintenances to reduce data volume. Attributes are technical and economic data that describe configuration items or components in more detail. In this ServiceNow system, the main attributes of MAPFRE are information about insurance, information about customers, various types of contracts, various incident reports, and so on. When creating any part in depth, it needs to consider recording all the necessary, the measurable and useful parts.

The design process of CMDB is a complex and highly interactive process with users. In this process, users need to fully understand the concepts and related principles of CMDB. We need to fully communicate with users about the risks and costs of maintaining CMDB in the later stage, so that users can consider, consider and plan one by one, so as to avoid the failure of CMDB projects and help them to use it. Users optimize and improve the management system of CMDB, define the role of personnel, and combine the change process to maintain the accuracy and fresh vitality of configuration, so as to help users maintain CMDB continuously and give full play to the value of CMDB.

**Fill the CMDB with data**

Organizations are unlikely to enter all information manually in CMDB. Given the complexity of today's IT environment, this is unmanageable. In addition, the data are incomplete and accurate at any point in time. The solution is to collect most of the configuration items by scanning the IT infrastructure and passing data to fill in the CMDB initially and then update the CMDB. CMDB always represents nominal inventory and contains regulatory compliance information. Therefore, any changes to CMDB must be made in a controlled manner and authorized and verified by the change management. In the process of data input, the company's articles of association and social laws should also be complied with. Increasingly stringent regulations, such as the Sarbanes-Oxley Act and higher penalties associated with licensing infringements, are other factors that make maintaining accurate and in-depth information on configuration items more critical than ever. Most companies have a large number of CIs involved in financial reporting, from the computers used to track inventory to the computers used to compile profit and loss statements. The key is to know where they are, what protections are in place to prevent unauthorized access, and you will be able to detect any changes.

In the process of input data, the first thing to do is to identify the main data sources and import data from them. It also requires that the system can automatically import and synchronize data. It is also important to maintain the process and implement it using tools. Integrate and open the CMDB with the operation and maintenance process itself, so that the data consistency, accuracy and integrity of the CMDB are guaranteed. The process of CMDB configuration lifecycle management integrated into the enterprise's unified operation and maintenance process management.

## **Functions help it easy**

When a CMDB system is built, the usefulness of CMDB is usually limited by its inherent complexity. More often, CMDB itself becomes a data black hole. It has not lightened the burden of IT management, but increased the burden. If your CMDB needs a specialist to manage it, it's clear that your CMDB may not only be helping you, or at least helping you, but not helping you as much as possible. If this is the case with your CMDB, some changes are needed. Make sure that your community-managed database provides these four functions that will turn it from a handicap to a help.

There is an excessive dependence on manual data input or batch loading, which usually results in configuration drift and then data outdated or inaccurate. Manual creation of relationship or dependency information is particularly problematic and difficult to maintain. Adding new or custom integration to input data should be a relatively fast and simple process. Adding new or custom integration to input data should be a relatively fast and simple process. So, this requires multiple sources to input data easily.

In an extended IT organization, users also represent a fairly diverse group, including asset management, security, IT performance and availability monitoring, and regulatory compliance. CMDB should be able to support different user groups of configuration item (CI) information and be applicable to users both inside and outside the IT department. This system should easily support multiple users of configuration item information.

In addition to CI, CMDB stores relational information. However, building and maintaining these relationships is often a challenge. The ability to easily generate application dependency diagrams is critical to support change management and other ITSM processes. Application

dependency mapping provided by your CMDB can also help significantly improve security. Therefore, simple application dependency mapping is important for CMDB systems.

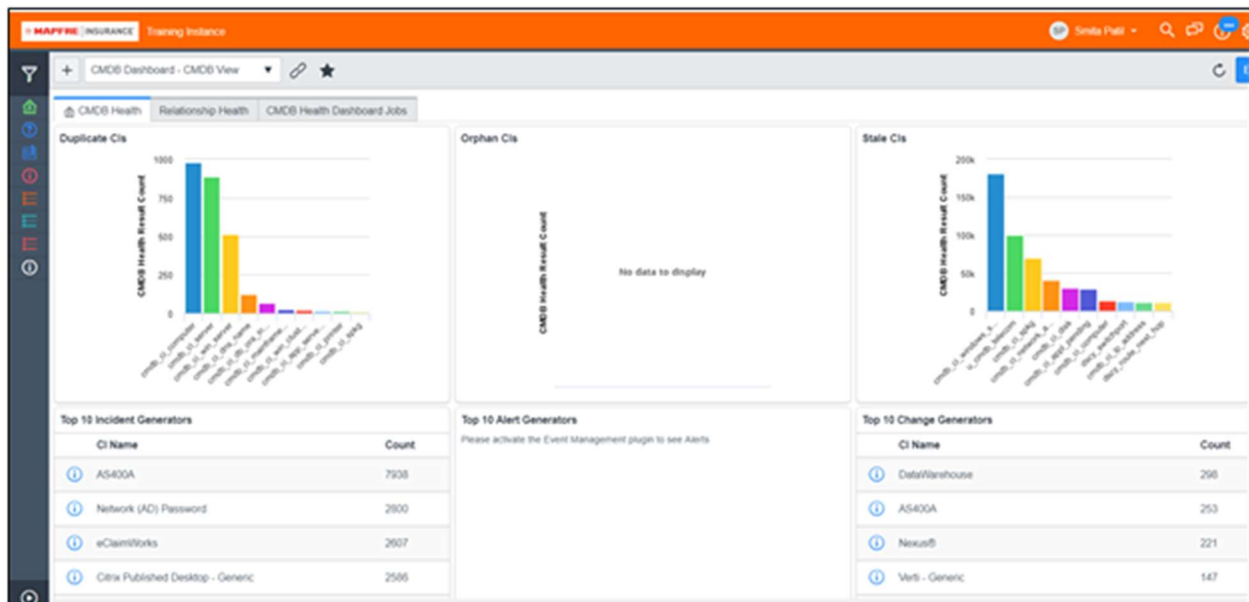
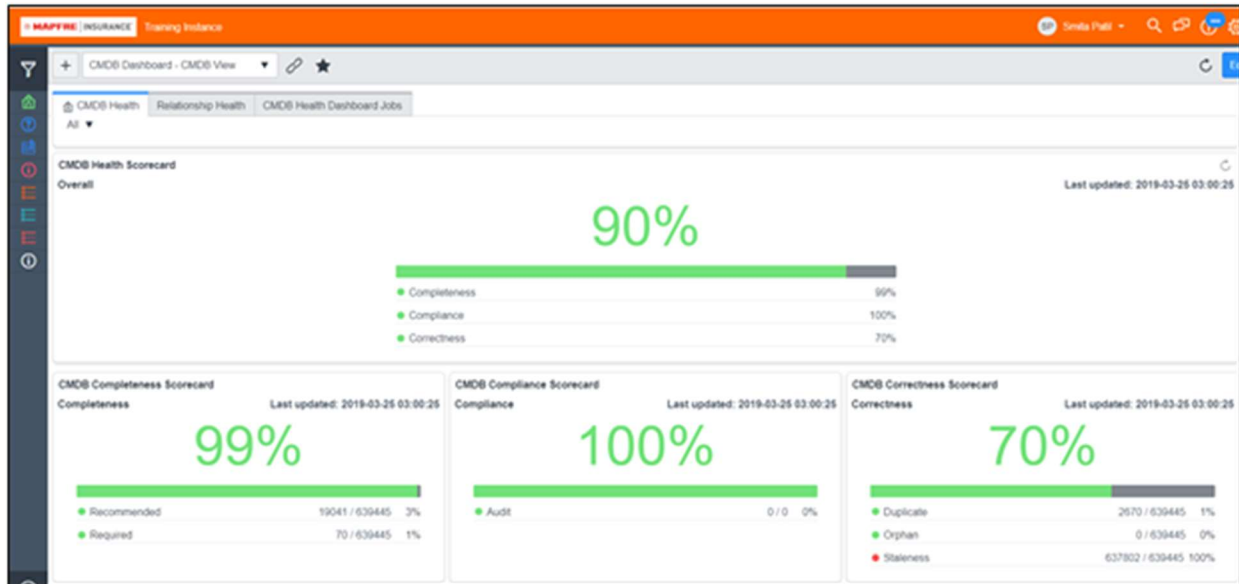
In the past, IT infrastructure, applications and CMDB were relatively static, and management could rely on discovery updates to keep information up to date. CMDB now has to support more dynamic environments on a regular basis, such as public, private and hybrid clouds, let alone traditional environments. CMDB now has to support more dynamic environments on a regular basis, such as public, private and hybrid clouds, let alone traditional environments. In addition to discovery mechanisms or manual-based mechanisms, CMDB should also support event-driven updates and automatic changes. CMDB should also easily support CI allocation under configuration and/or change management. Therefore, the system must easily support dynamic environments.

In a short, it means that everything can be handled easily so that a successful CMDB system can be achieved.

## Review CMDB Health Dashboard configuration and utilization

CMDB dashboards display CMDB health reports and let you configure the CMDB health KPIs and metrics that CIs are evaluated for.

We have configured the CMDB health Dashboard. Below is the Screen shot for MAPFRE CMDB Health Dashboard.





- Some of the most frequent ‘poor decisions’ that happen in organizations with poor quality CMDB data.
  - Misunderstanding the impact of a planned change.
  - Not knowing what CI is causing a Major Outage, increasing MTRS.
  - Escalating to the wrong CI/Service Support Team.
  - Events are not correlated to the correct CI.
- Managing CMDB quality is more than just collecting CI’s and reporting. CMDB Health Audits drive actionable tasks. Process governance ensures remediation and enables continual improvement.
- Manage CMDB quality with actionable insight into Completeness, Compliance, and Correctness.
- CMDB that is current, accurate and complete is the linchpin for success in Service Management. Poor CMDB quality is costing organizations very high.

### **Recommendations on the CMDB Health Dashboard**

The overall CMDB health score consists of three major metrics which are **correctness, compliance and completeness.**

- **Completeness**

Additional fields that should be populated for a CI to be considered complete Required: Mandatory fields.

- **Compliance**

There are no Audits carried out for any configuration items and hence compliance metrics is not showing any CIs. By performing scheduled or on-demand audits of CMDB data, we

can determine which records match the expected attributes, CI relationships, and relationships to other records in the system.

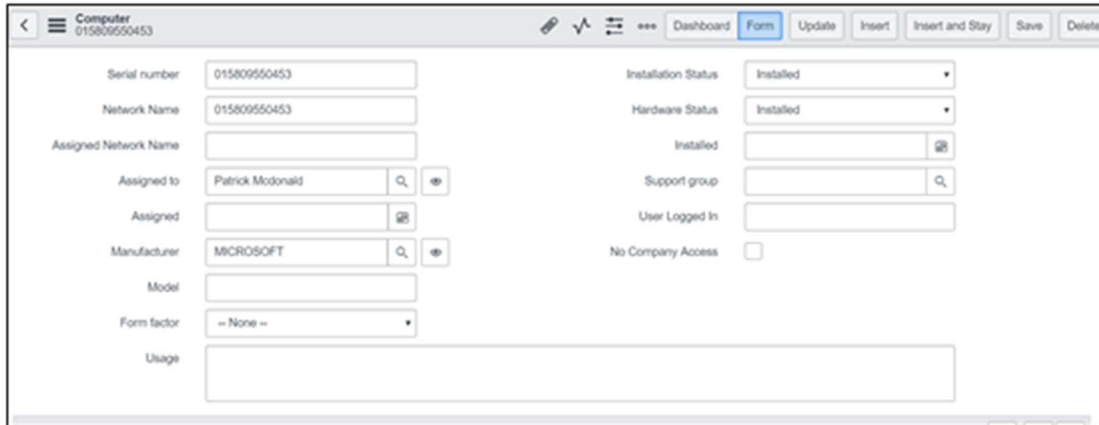
- **Correctness**
- **Duplicate**
- **De-Duplication Task:**

When the instance encounters duplicate CIs during identification and reconciliation, it groups each set of duplicate CIs into a de-duplication task for review. Use de-duplication tasks to track the duplicate CIs until they can be resolved. A large number of duplicate CIs might be due to weak identification rules.

Based on the analysis of de-duplication tasks, you can determine which CI should remain active and which of the duplicate CIs in the Duplicate Audit Results records are stale or incorrect. Determine if it is appropriate to delete or inactivate any of these CIs. Below is the example of two Duplicate CI records.

The screenshot shows a ServiceNow form for a Computer CI. The breadcrumb trail is "Computer" with the ID "015809550453". The form contains the following fields and values:

- Serial number: (empty)
- Network Name: 015809550453
- Assigned Network Name: (empty)
- Assigned to: (empty)
- Assigned: (empty)
- Manufacturer: (empty)
- Model: (empty)
- Form factor: -- None --
- Usage: (empty)
- Installation Status: Installed
- Hardware Status: Installed
- Installed: (checkbox)
- Support group: (empty)
- User Logged In: (empty)
- No Company Access: (checkbox)



The screenshot shows a ServiceNow configuration form for a Computer record. The form is titled "Computer" and has the ID "015809550453". The form is divided into two columns of fields. The left column contains: Serial number (015809550453), Network Name (015809550453), Assigned Network Name (empty), Assigned to (Patrick Modonald), Assigned (empty), Manufacturer (MICROSOFT), Model (empty), Form factor (-- None --), and Usage (empty). The right column contains: Installation Status (Installed), Hardware Status (Installed), Installed (empty), Support group (empty), User Logged In (empty), and No Company Access (checkbox). The form has a top navigation bar with buttons for Dashboard, Form, Update, Insert, Insert and Stay, Save, and Delete.

- **Orphan**

We can configure the Rule based check to identify **Orphan** records. Orphan Configuration items are not showing up on MAPFRE dashboard since it's not set up. We can change the configuration to add the template which can check if the Configuration item is the part of business service and so we can know the details on Orphan CIs and can take actions on the same.

- **Stale**

Currently there are many **Stale** configuration items showing on the dashboard. Stale configuration items can be reviewed, and business decisions can be made if they are required or not. Actions taken on those CIs will ensure freshness if a CI is updated within the defined time period.

Also, we need to ensure the Configuration items **relationship** is properly linked so that business operations are tracked accordingly. By ensuring that the above points are looked in, we can see better proper CMDB dashboard with accurate Configuration item data populated.

**Reflections:**

Working in MAPFRE CMDB ServiceNow was a very good learning opportunity as we got an opportunity to learn CMDB. While working we've developed a good knowledge of CMDB data model, data flow, roadmap, new industry standards and design standards.

While working we've faced issues with logging into the CMDB system at the start of the project. After the issue was resolved we started our research. We reviewed the existing system and came up with recommendations to make the CMDB more secure with best practices. We got to know about various industry standards while working.

Despite the technical knowledge, working in a team also helped us to improve our skill. We developed skills that can help us in the business environment such as oral communication, written communication, verbal communication, project management, team work, planning, self-learning and setting a goal. Each member in the team had a good knowledge of technology and project management which helped us achieving our goal.

The MAPFRE ServiceNow team was also very cooperative and helped us in every part where we had doubts. They provided their best resources that helped us completing our research. We also had a demo of the MAPFRE ServiceNow CMDB at the start of the project which helped us to know the system well.

## SUMMARY CONCLUSION

### Recommendations on CMDB design and data model

#### Design

One of the most important aspects of a successful configuration management capability is for everyone who uses the CMDB to understand the data. In some respects, this is the most significant critical success factor—after all, what good is a decision support system if no one understands how to use the data within it? Consistency is the key here:

- Terminology and definitions: key words and acronyms are used consistently and there are clear organizational definitions for them
- Consistent data: every field has a defined purpose and is only used for that purpose (i.e. no field overloading)
- Visualizations:
  - Screens and reports have similar design
  - Colors are used consistently
  - Views of configuration item (CI) inter-dependencies have a consistent structure.

Before populating the CMDB with data, consider starting with the end state in mind. It is important to have a vision of what the CMDB will look like when it is fully implemented and for the major milestones along the way as part of your future-state roadmap. Each iterative structured improvement effort should also have a clearly defined end-state (for that effort) in mind before beginning implementation efforts. ServiceNow recommends utilizing use cases to help develop

your end-state vision(s). How will users of the CMDB use ServiceNow? • What CI classes are needed to support their functional roles and duties?

- What CI attributes are needed for each CI class so the right decision support information is readily available?

- What dependencies between CIs are needed to fulfill the envisioned use cases?

Design ideas include:

- **Fields**

Change which fields are required and when, which fields support Rich Text, etc.

- **Statuses**

Change CI statuses and/or the One-Steps that are initiated when a CI enters each status.

- **Form**

Change the form theme (background and text color), tab order, and size. Change the threshold and/or colors for Open Incidents logged against a CI.

- **Actions and One-Steps**

Create Actions/One-Steps to automate the workflow.

- **E-mail**

Change the e-mail templates that are used to create the e-mails sent by One-Steps or Automation Processes. Or, disable/change when and to whom notifications are sent (ex: Send a notification to a computer owner whenever their CI Record changes).

- **Field Value Options:** Use Table Management to add/edit Lookup Object values for use in drop downs (ex: Computer Manufacturer).

- **Visualizations:** Add, remove, or edit Upstream or Downstream Relationship options.

The MAPFRE CMDB design has many things that can be recommended:

- Asset Retirement
- Email notification
- Required texts
- Color Combinations
- Accessibility
- Unused CSS
- Consistent design
- Broken Image

**Data model:**

There is a huge number of the modern enterprise on our society, at the same time, all the organizations want to provide a better service. IT is a very important part for all the organizations, and it provides the processability for all the modern enterprise. Many organizations are trying to improve their service levels by automating their service offerings. In order to come true this goal, these organizations need to know all the elements of the enterprise IT infrastructure and their relationship to service offering. “IT infrastructure continues to grow and become more complex, especially with the proliferation of hardware, software, appliances, virtual machines, cloud services, and mobile devices.” (ServiceNow Configuration Management Database) An accurate and reliable Configuration Management Database (CMDB), is vital to an organization for effective configuration management, asset management, targeted support and compliance.

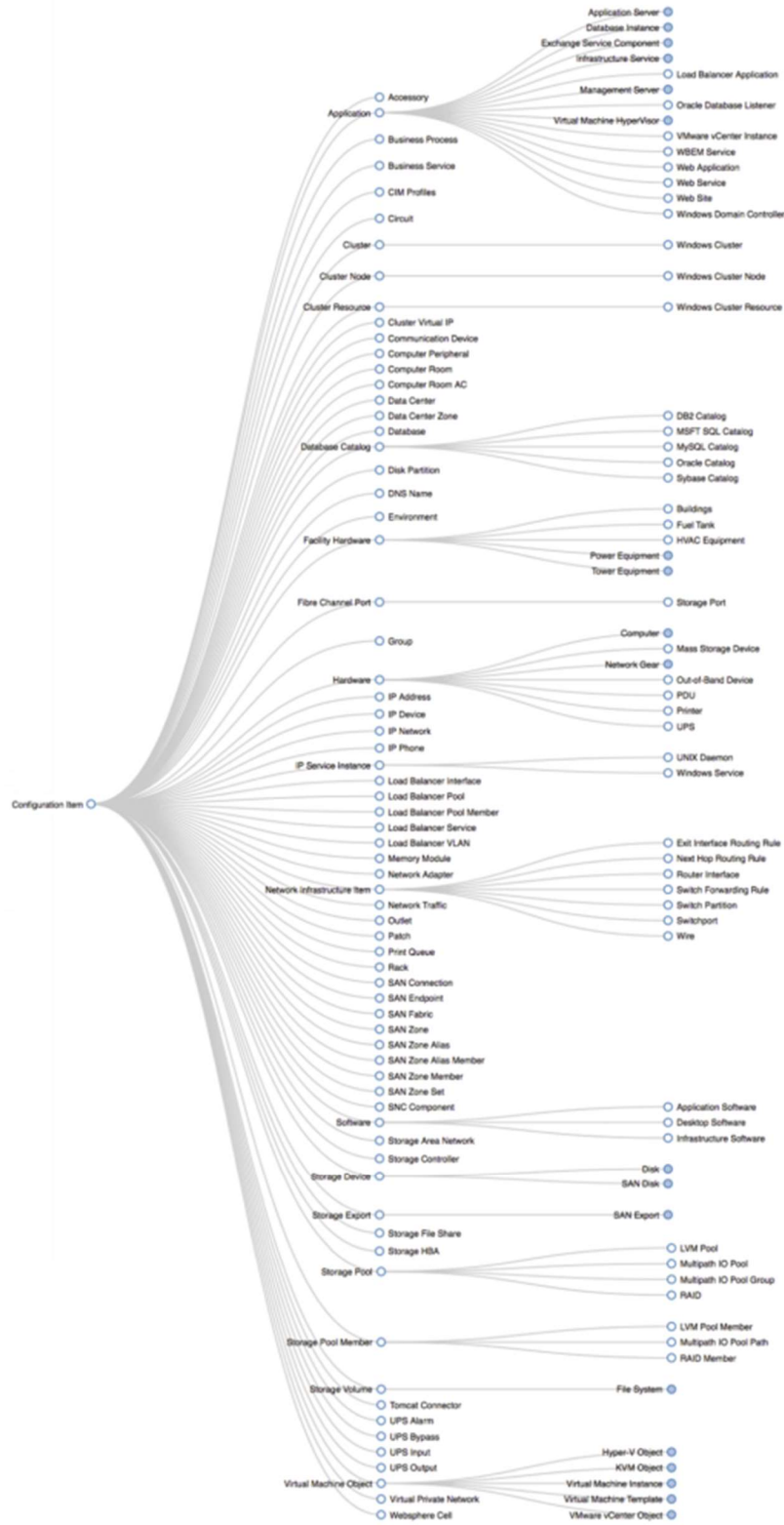
“The ServiceNow CMDB provides a consolidated system of records for IT. The CMDB can be made service-oriented by establishing Logical CIs (Business Services, Components, etc.) to serve as a layer of abstraction underpinning the ITSM Processes.” (JADE Global) CMDB is provide a lot of convenience, and it has a huge advantage of improving service level. CMDB ServiceNow also has a good effect on MAPFRE Insurance Company. In this part, we focus on CMDB ServiceNow data model. In the following content, we will analyze the CMDB data model.

At the first, we should know what the data model is and how is the CMDB’s data model. When we mention a data model, it is an abstract model. Data model organizes elements of data and standardizes how they relate to one another and to properties of the real-world entities. Overview of data modeling context: Data model is based on Data, Data relationship, Data semantic and Data constraint. “A data model provides the details of information to be stored and is of primary use when the final product is the generation of computer software code for an



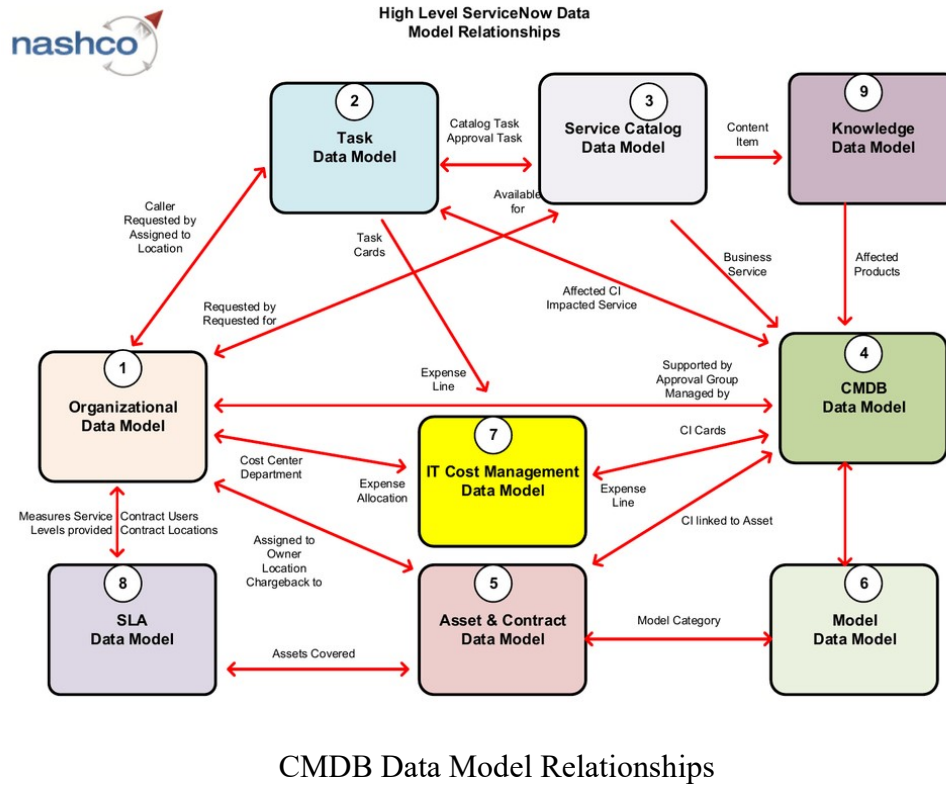
application or the preparation of a functional specification to aid a computer software make-or-buy decision.” (Paul R. Smith & Richard)

In the CMDB system, “the Configuration Management Database (CMDB) is a series of tables that contain all the assets and business services controlled by a company and their configurations. Configuration items such as computers and other devices on the network, software contracts and licenses, and business services are represented.” (CMDB data model) It has different layers, and there is a diagram to show the data model’s structure. In this diagram we can find the CMDB’s content, levels, configurations, and data source very easily.

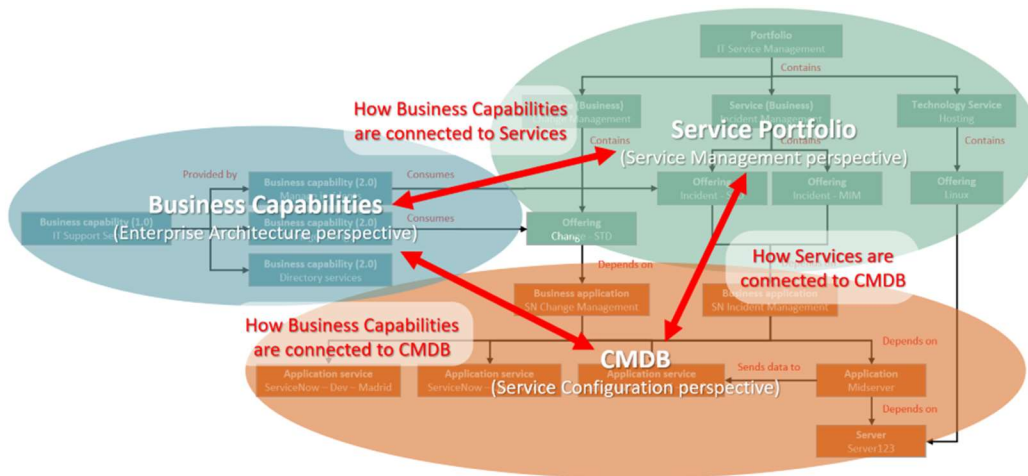


CMDB Data Model

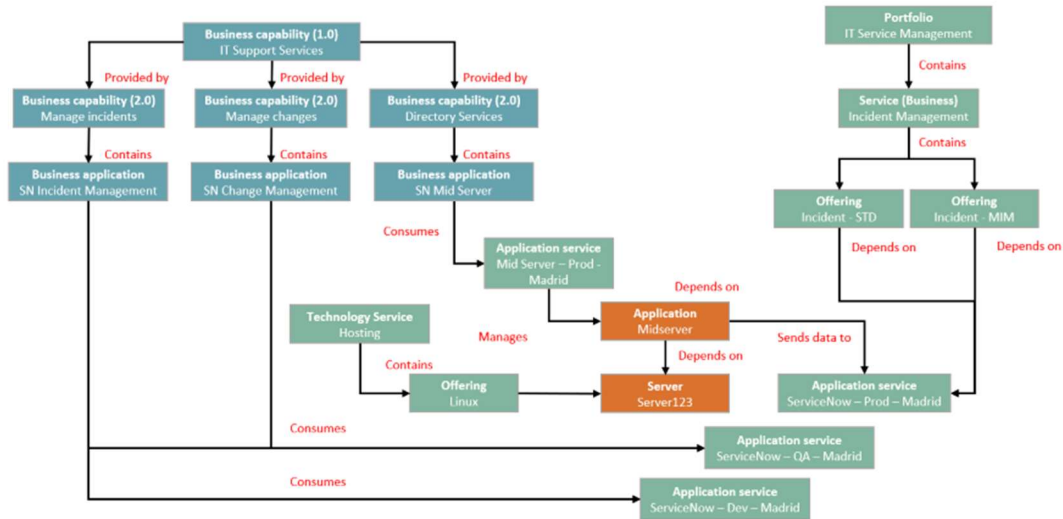
On another hand, there is a diagram to show the relationships between the different data model.



CMDB Data Model Relationships



Picture 3. CSDM Figure ITSM Sample Generalization



Picture 4. CSDM Figure ITSM Sample Generalization Detail

### Data Model Recommendations

As we mentioned before, data model is based on Data, Data relationship, Data semantic and Data constraint. According to ANSI in 1975, data model has various form. Conceptual data model, Logical data model, and Physical data model, all of these are different aspects of data model. In the following part, I will come up with some recommendations about the data model for different aspects.

- **Update data management and maintenance.**

In the CMDB, it also contains metadata, and this concept overlaps with a metadata repository. CMDB also used metadata to run IT organizations more effectively. How to keep data up to date has been a historically difficult problem for metadata, but configuration management solved this problem. CMDB implementations often involve federation – the inclusion of data into the CMDB from other sources – such as asset

management, in such a way that the source of the data retains control of the data. Federation is usually distinguished from ETL (extract, transform, load) solutions in which data is copied into the CMDB. That means all the metadata are copy to CMDB system, all the information will be stored. For some project, if it has some information already exist. After this project update, the previous information will still exist, but the new data also will be copied into the system. If the previous information is incorrect, or if the user updates the information because of new research findings, the previous incorrect and inaccurate information will cause great disturbance to users who searching for this item.

So, update data management and maintenance are very important, it will reduce the distractions of erroneous, outdated information. It allows users to focus on valuable information. At the same time, it can make the database management easier, and data model more stable.

- **Realize more data visualization functions and help users to manage data better.**

Most CMDBs are just databases. This means they have no traits, features, or benefits of more complex applications. They lack tools to view data via complex visualizations or tools for advanced discovery. This means that most companies need to invest in an application layer that adds such constructs to their CMDB, which adds a layer of complexity and cost that most companies do not plan for or expect.

Data visualization helps abstract data models and data relationships are presented in a vivid form. Powerful data visualization tools can help users understand the data relationships better and discover more valuable information.

- **Optimize the authority management and divide authority level clearly.**

By asking the MAPFRE company's employees, I learned that “Rights are by role. There are read only and update rights by “type” of configuration items. (I.E. EUS has rights to update desktop equipment. EUS Voice & Data update telecom data, etc.)” The issue of access permission sometimes brings a lot of inconvenience. For example, the company start a new project, so it needs to set up a new temporary working group. Since the team members come from different departments and different positions, this means that some team members may not have access permission to check relevant materials and data. This will cause inconvenience to team members and delay the progress of the project.

Opening a new configuration module for setting temporary permission levels and managing changes to employee permissions would be a good method to improve this situation. At the same time, set up the commissioner for the supervision and maintenance of the setting module, when there is a new permission change application, only need the administrator to make a simple operation. Not all the projects require the involvement of senior management or staff who has a high authority. In this way, the work efficiency can be improved, and the progress of the project can be promoted.

- **Enhance the stability of data models and structures, especially during the periods of frequent changes in the internal structure of a company.**

Staff and position changing are very common in large-size companies. At the same time, large companies have a huge database, which adds the difficulty to daily management. Therefore, it is very important to enhance the stability of the data model. In the physical layer, employee need to use several quality servers, and prepare reserve servers. In the application management layer, employee need to do

routine maintenance to prevent bugs and other data errors, such as data security, data overflow and data loss.

- **Provide various data model configuration method.**

Some users are used other database management systems before, now they start use CMDB system. One problem for these users is in how to trans the whole system to CMDB system. There is no denying that different systems have different data models, and during the transition, sometimes errors may be made and sometimes data may lose. This is a reasonable problem for some new users. CMDB uses the OOTB (out of the box) data model which very simple and easy to operate. Therefore, we can develop a variety of data model configuration methods to solve this problem. For example, we can develop interfaces where users can customize the data model and parameters, allowing a transition between two different data models.

## **Recommendations on MAPFRE CMDB Data Flow Management**

### **Automate the Process with Flow Designer**

Flow Designer enables rich process automation capabilities in a consolidated design environment. It enables process owners to use natural language to automate approvals, tasks, notifications, and record operations without having to code.

We can expand the MAPFRE Flow Designer solution to integrate with external instances and third-party applications with a separate subscription to Integration Hub.

### **Benefits**

Flow Designer provides process owners and developers these benefits.

- Consolidates multiple Now Platform automation capabilities into a single environment so process owners and developers can build and visualize business processes from a single interface. Includes flows and actions triggered by Service Catalog events.
- Consolidates configuration and runtime information into a single environment so process owners and developers can create, operate, and troubleshoot flows from a single interface.
- Provides natural-language-descriptions of flow logic to help non-technical users understand triggers, actions, inputs, and outputs.
- Promotes process automation by enabling subject matter experts to develop and share reusable actions with flow designers.
- Reduces upgrade costs, with upgrade-safe Now Platform® logic replacing complex custom script.
- Reduces development costs by providing a library of reusable actions.



- Allows extending Flow Designer content by subscribing to Integration Hub or installing spokes.

### **Configure the Operational Intelligence extension**

Configure the MID Server Operational Intelligence extension to enable the MID Server to pull raw metrics from external systems, to detect anomalies and report anomalies to the instance along with raw data. This MID Server Operational Intelligence extension is required and must be running in order for MAPFRE system to be able to collect Operational Intelligence data.

The extension runs for as long as it is enabled. This provides a persistent connection to the MID Server to constantly listen for raw Operational Intelligence data from external systems.

The MID Server Operational Intelligence extension:

- Receives raw metric data, batches them and sends them to the instance at specified intervals.
- Detects anomalies and sends a report to the instance.
- The information that is sent to the ServiceNow instance is relevant for Operational Intelligence, so data processing is efficient.

### **Integration Hub**

IntegrationHub enables execution of third-party APIs as a part of a flow when a specific event occurs in ServiceNow. These integrations, referred to as *spokes*, are easy to configure and enable you to quickly add powerful actions without the need to write a script. For example, you can post a message and incident details in a Slack channel when a high priority incident is created in MAPFRE incident request.

IntegrationHub provides the following functionality:

- Spokes for base system integrations
- Using IntegrationHub actions in Flow Designer, you can:
  - Post messages and ServiceNow incident, problem, and change record details to HipChat, Slack, or Microsoft Teams communications channels.
  - Synchronize data across multiple production instances using the eBonding spoke as an example.

### **Agent Intelligence**

Use machine-learning algorithms to set field values during record creation such as setting the incident category based on the short description. Train predictive models to act as an agent to categorize and route work based on your past record-handling experience.

It is recommended that MAPFRE enables Agent Intelligence to handle higher volumes of incoming requests at lower costs. This will help MAPRE to automate the categorization and assignment of requests to gain these benefits.

- Reduce task resolution times.
- Reduce the number of interactions required to resolve tasks.
- Reduce the error rates of categorizing and assigning work.

## **Recommendations on CMDB roadmap**

Enterprises nowadays are more and more passionate about technology and particularly with software system solutions. The gross outlay on these is relevant and exponentially turning into an upscale affair year on year. Having software system-as-a-service (SaaS) subscriptions has hyperbolic the chance of associating price with the software use. Despite this, several firms still haven't given comfortable attention SAM.

Consequently, several firms have very little bird-view insight into whether or not they are unit compliant or not and unaware of the particular payment and relevant value on the software system. From the last 3 decades, many firms, proprietary and niche product enterprises have targeted on strict compliance. From the last decade, software system industry is specializing in the compliance and security. This is often for the most part because of the actual fact that it's outsourcing more and more spreading across the continents.

Hence there's a much bigger concern for the businesses on computer code compliance and potential risk of audit. This brings with it, the danger of provider audits, giant monetary fines that eventually damage company name. Though repeatedly these areas are handled inside the organization, to manage these risks, guided missiles must be associated integral parts of the organization.

## **Software Asset management**

CMDB lacks Asset management capabilities. There are lots of SAM tools available in the market today including free wares and low cost/small scale for small organizations and enterprise wide asset management products. Some of the growing merchandise which have set up themselves as leaders in the Asset Management field are:

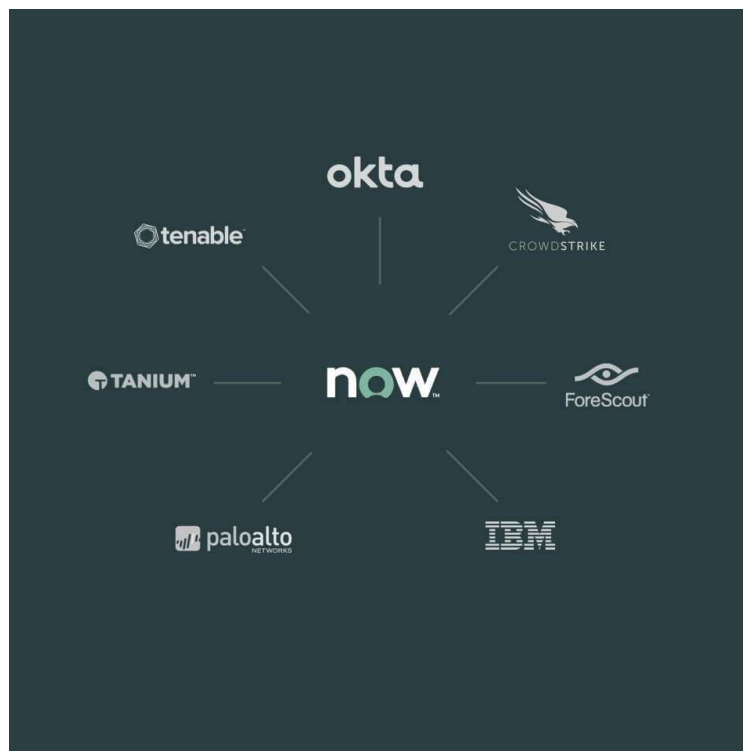
- IBM Tivoli
- BMC IT Asset Management
- CA IT Asset Management
- Oracle PeopleSoft
- HP Asset Management
- ServiceNow Asset Management

### **Business Benefits of using SAM**

- **Cost Reduction**
  - Avoid getting licenses that aren't needed for a company.
  - Go for bulk computer code purchase with discounts once the organization is aware of the computer code wants.
- **Security**
  - All the software package put in in a company network are often simply half-track and evaluated.
- **Compliance**
  - One of the main edges of victimization SAM is protective a corporation from the unauthorized or unintentional usage of banned package licenses and make sure the package license compliance.
- **Reduced IT Support**
  - SAM helps preventing the unauthorized package usage in a company and successively helps to cut back the head-count of IT support staffs by specializing in the required package solely.

## Data Security

This one's not a challenge, although a priority for users. Given the criticality of data or information, it's imperative that the transactions happens during a safe and secure manner. Here, as an answer, ServiceNow offers a couple of integrations and operates through a firewall, that successively, possesses a selected port that ensures traffic management in an organized manner Integrations will move through HTTPS instead of HTTP, encrypting the whole chunk of the transmitted knowledge. Through a singular sign-on and a mutual authentication system, the system assures an explicit layer of security therefore permitting the users to require a glance at the requested knowledge. Further, extra layers of restrictions can be added through access management lists, and therefore the facilitation of high-security plugins would establish even stricter standards of security.



## **MITRE ATT&CK (Adversarial Tactics, Techniques and Common Knowledge) FRAMEWORK**

MITRE's framework is a collection of information about advanced persistent threats (APTs) that aims company's networks. The main aim or objective of the framework is to gather all relevant and available information about these groups and categorize it in a way that makes it available and usable for enterprise security teams.

### **Enterprise ATT&CK Matrix**

The Enterprise ATT&CK Matrix is the most widely-familiar component of the MITRE ATT&CK framework. It organizes various techniques used by threat actors based upon their role in the incident attack chain. The framework breaks an incident into the following stages:

- Initial Access
- Execution
- Persistence
- Privilege Escalation
- Defense Evasion
- Credential Access
- Discovery
- Lateral Movement
- Collection
- Exfiltration
- Command and Control

Under every stage is a collection of strategies that can be used to accomplish the desires of the stage. This fact can be beneficial offensively in creating simulations to test the effectiveness of existing tools, defensively by means of encouraging deployment of options to tackle unique threats, and as phase of incident response by way of presenting data about the motive of a recognized issue of an attack. The information available in the MITRE's ATT&CK matrix can be used proactively. Organization based on their valuable assets and intellectual properties can take steps to minimize their exposure, risk and impact using listed techniques.

## **Recommendation on Data Security**

### **The ServiceNow Solution:**

ServiceNow® Security Operations module can help organizations in security, respond quicker and with a lot of efficiency to the external threats and obtain a definitive read of their security posture. In addition, it is capable of connecting the progress and the systems management capabilities of the existing platform with the security information from the leading vendors to present your groups one platform for response that may be shared between security and IT.

With orchestration, automation, and higher visibility, groups will respond a lot of expeditiously, reducing business risk. the answer leverages the ServiceNow® Configuration Management Database (CMDB) to map threats, security incidents, and vulnerabilities to business services and IT infrastructure. This mapping permits prioritization and risk marking supported business impact, making certain your security groups area unit targeted on what's most important to your business.

In addition, visual business service maps show the dependencies of affected systems to reduce modification requests and period. as a result of Security Operations is an element of the

larger currently Platform, this CMDB is maintained by the whole organization, not simply security. Connect security and IT Coordinate response across groups for sander task handoffs between teams and faster resolution.

Get answerableness across the organization and grasp work is obtaining finished SLAs. Drive quicker, additional economical security response scale back the quantity of your time spent on basic tasks with orchestration tools. Mechanically add threat intelligence to security incidents to hurry up redress and integrate a response platform together with your existing security portfolio.

Know your security posture read your current security standing with customizable dashboards and reports backed by quantitative information. Improve processes and team performance through metrics and post-incident reviews. Customizable period dashboards show security posture.

DATA SHEET servicenow.com 2 The currently Platform delivers extra enterprise capabilities that groups will leverage promptly, like inherent service level agreement (SLA) thresholds, skills-based routing, notifications, advanced workflows, and live collaboration. Security Operations additionally isolates security events from the remainder of the system, guaranteeing that sensitive security information remains confidential.

#### ServiceNow Security Operations integration

The ServiceNow platform provides many mechanisms for developing integrations with external systems. The ServiceNow Security Operations product suite adds integration capabilities meant to contour the method of integration with security-focused external systems.



Most of the ideas during this guide assume some familiarity with commonplace ServiceNow practicality. To integrate with the safety Operations suite, at a minimum, information of the subsequent ServiceNow ideas is required:

- Script includes
- Inbound/outbound web services
- Data sources
- Import sets
- Transform maps

### **Types of integrations provided**

The Security Operations applications (Security Incident Response, Threat Intelligence, and Vulnerability Response) is seamlessly integrated with alternative ServiceNow applications to boost their practicality.

### **Third-party integrations**

Many of the integrations enclosed within the base system need very little or no setup and operate within the same manner. Integrations, like the Qualys Cloud Platform, however, need separate steps for fitting the combination, getting into AN API key, and setting API credentials. Others support totally different sets of scan and search sorts and different rate limits.

### **Threat Intelligence integrations**

The Threat Intelligence application permits you to access and supply some extent of reference for your company's Structured Threat info Expression (STIX™) knowledge. enclosed in

Threat Intelligence is that the Security Case Management application, that provides a way for analyzing threats to your organization exhibit by targeted campaigns or state actors.

STIX is for describing cyberspace threat information in a standardized and structured manner. Using STIX data and Trusted Automated Exchange of Indicator Information (TAXII™) profiles, threat professionals will use shared cyber threat data to isolate threats that are antecedently known by your company and from different sources. TAXII makes widespread machine-driven exchange of cyber threat data potential.

STIX™ and TAXII™ are trademarks of The MITRE Corporation.

### **Third-party lookup sources**

Threat Intelligence integrates with third-party threat search sources to spot potential threats. whereas a search is process or once it's complete, you'll click the reference link to open the third-party web site and examine the results of the lookups performed.

### **IoC (Indicator of Compromise) lookups**

IoC lookups is performed to search out known malware and suspicious URLs and IP addresses. The integration cards can be viewed by selecting **Security Operations > Integration Configurations**.

## Integration Configurations

The screenshot displays the 'Security Integrations' section. At the top, there is a 'Category' dropdown menu set to 'Threat Intelligence' and a 'Show Configurations' dropdown menu set to 'No'. Below these filters, there are four integration cards arranged in a 2x2 grid:

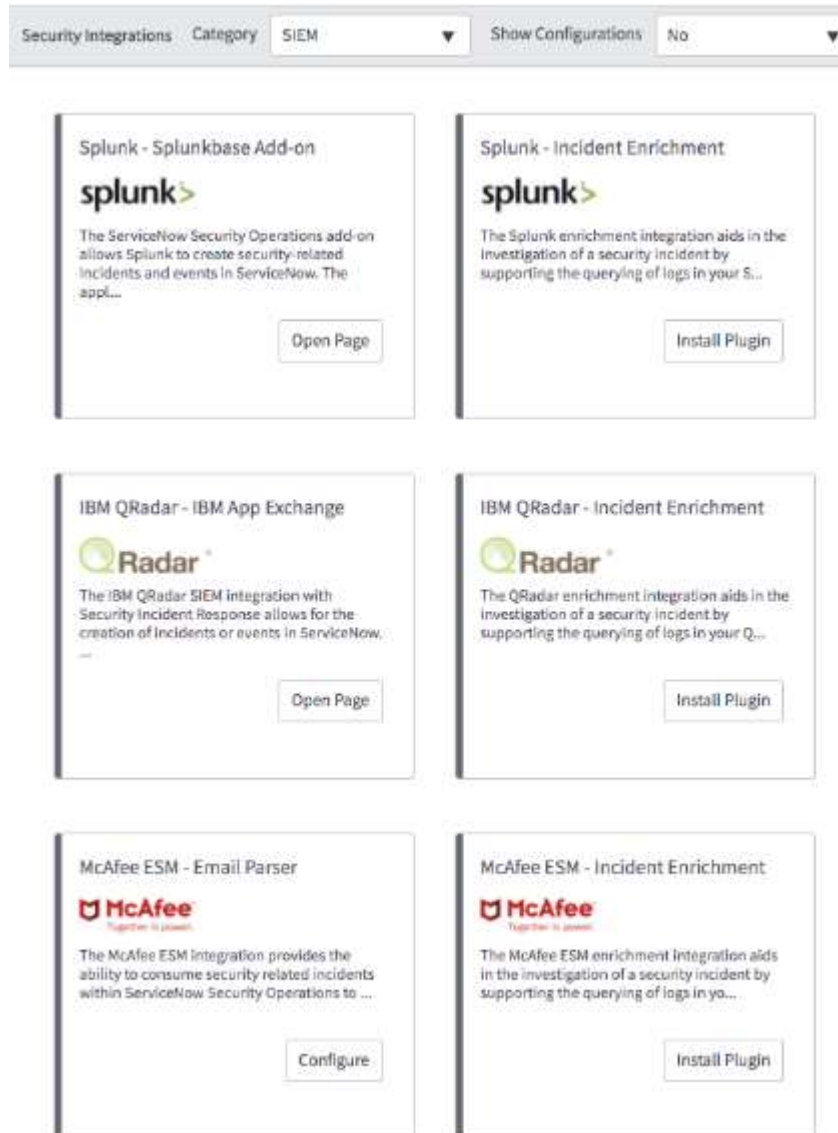
- CrowdStrike Falcon Intelligence:** Features the CrowdStrike logo and text stating: 'CrowdStrike Falcon Intelligence Integration provides the Security Operations Threat Intelligence application the ability to enr...'. An 'Install Plugin' button is at the bottom.
- Recorded Future:** Features the Recorded Future logo and text stating: 'The Recorded Future integration provides the Security Operations Threat Intelligence application the ability to enrich security...'. An 'Install Plugin' button is at the bottom.
- VirusTotal:** Features the VirusTotal logo and text stating: 'The VirusTotal integration enables you to request the analysis of suspicious IP addresses, hashes, and URL addresses to aid in...'. An 'Install Plugin' button is at the bottom.
- OPSWAT Metadefender:** Features the OPSWAT logo and text stating: 'Metadefender's threat intelligence integration allows for the analysis of suspicious IP addresses, URL addresses, and hashes to...'. An 'Install Plugin' button is at the bottom.

### Security Incident Response:

Security Incident Response simplifies identification of incidents with high risk and provides workflow and automation tools to pace up remediation. Data from your existing security controls or Security Information and Event Manager (SIEM) are imported via APIs or electronic mail indicators to automatically create prioritized security incidents.

Customize security advancement templates to automatize tasks and guarantee company best practices area unit followed. Simply read and track response tasks that run in parallel. The system can cue assignees if their tasks aren't completed on-time per SLA thresholds, or it will intensify tasks if necessary. This ensures no tasks or selections area unit accidentally incomprehensible. Security analysts will communicate with stakeholders from within the currently Platform via conference calls or Connect chat to stay everybody within the loop.

Monitoring tools, such as Splunk, can be integrated with Security Incident Response so that security activities imported from those tools automatically generate security incidents. You can also import data from third-party tools into security alerts.



**Vulnerability Response:**

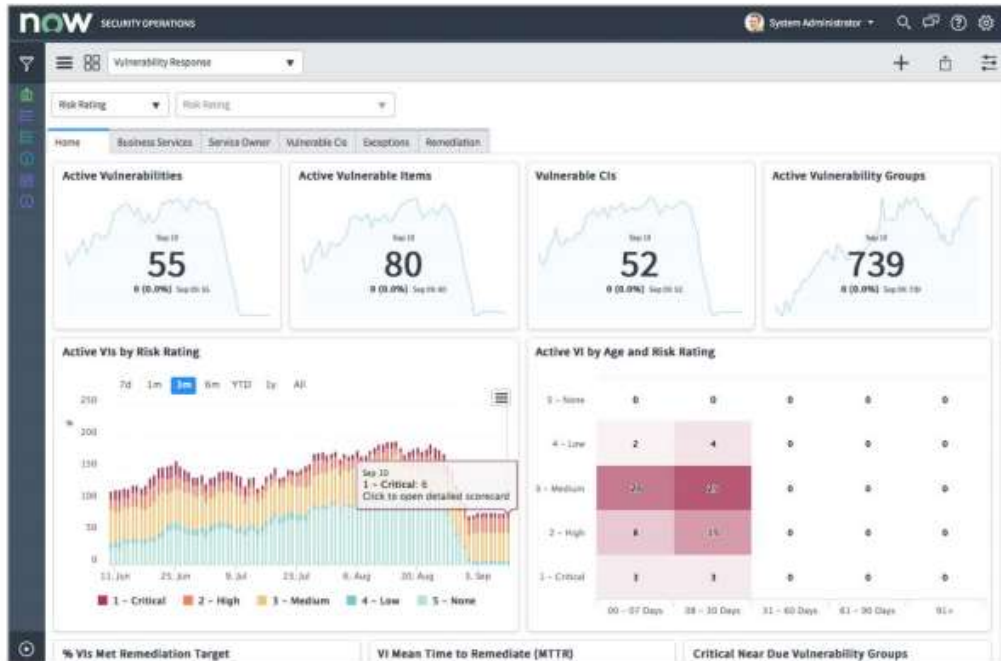
Vulnerabilities don't often get the identical amount of notice as phishing attacks or advanced power threats, but when a vital vulnerability is exploited, companies can go through main damage. A study performed via ServiceNow and the Ponemon Institute found that almost

half of groups surveyed had been breached in the past two years. For many of those, the breach was once due to a vulnerability for which a patch existed. However, many businesses have greater vulnerabilities than they can effectively preserve up with.

The Vulnerability Response application in Security Operations prioritizes vulnerable assets and adds context to assist confirm if business-critical systems are in danger. By investment the CMDB, it may also simply determine dependencies across systems and quickly assess the business impact of changes or period.

### **The ServiceNow solution**

ServiceNow® Vulnerability Response is a software that helps organizations respond faster and more correctly to vulnerabilities, join safety and IT teams, and furnish real-time visibility. It connects the workflow and automation competencies of the Now Platform® with vulnerability scan facts from leading vendors to give your teams a single platform for response that can be shared between protection and IT.



The Vulnerability Response dashboard highlights the current status and associated risk of active vulnerabilities in your organization.

Vulnerability Response gives a comprehensive view of all vulnerabilities affecting a given provider as well as the current country of all vulnerabilities affecting the organization. Response teams can additionally leverage the workflow and automation equipment in the Now Platform to remediate vulnerabilities faster. When fundamental vulnerabilities are found, a workflow can routinely provoke an emergency patch approval request. Once approved, orchestration equipment can follow the patch and set off an extra vulnerability scan to make sure the trouble has been resolved.

Vulnerability integrations help enrich the vulnerability information on your occasion by way of retrieving facts from exterior systems and vendors. Vulnerability Response includes some integrations, including the Qualys Vulnerability Integration and Microsoft Security Bulletin Integration. You can add others as needed.

Vulnerability Response gives a complete view of all vulnerabilities affecting a given asset or carrier via integration with ServiceNow® Configuration Management Database (CMDB), as properly as the contemporary state of all vulnerabilities affecting the organization. When used with the CMDB, Vulnerability Response can prioritize susceptible assets by impact, the use of a calculated danger rating so teams can focal point on what is most integral to your business. The threat score can encompass multiple elements in its calculation, consisting of the CVSS score of the vulnerability and whether the vulnerability can be without difficulty exploited, the use of facts from the vulnerability scanner and Shodan®.

Vulnerability Response, you can examine the library of known vulnerabilities to discover Configuration Items (CIs) with susceptible software program (as identified in the Asset Management module). The vulnerability data can be pulled from internal and external sources, such as the NVD.

For CIs with software program affected by means of a vulnerability, you can create changes, problems, and safety incidents. You can also view the library of Common Weakness Enumeration (CWE) documents from the NVD to recognize how they relate to the Common Vulnerability and Exposure (CVE) records. Knowledge articles related with the CWEs are protected for reference. As needed, you can update your system from the vulnerability databases on demand or by means of running user-configured scheduled jobs.

If the Qualys Vulnerability Integration plugin is activated and configured, Vulnerability Response can get hold of vulnerability statistics from the Qualys scanner in the shape of vulnerabilities and inclined items. You can also assign and remediate groups of CIs in bulk.

## **Benefits**

### **Connect security and IT**

Coordinate response throughout groups for smoother venture handoffs between groups and quicker resolution. Get accountability throughout the company and comprehend work is getting finished with remediation targets.

### **Drive faster, more efficient security response**

Reduce the quantity of time spent on simple duties with orchestration tools. Automatically prioritize and reply to vulnerabilities with workflows and automation.

### **Know your security posture**

View your current vulnerability status with customizable dashboards and reports backed by quantitative data. See which business services are impacted by critical vulnerabilities.

## **Conclusion:**

A well-established SAM setup can help an enterprise limit software costs, improve compliance and simplify processes for the software program requests from employees. SAM can additionally assist manage stock via accurate records captured in databases, which in turn helps to identify organizational software program wants and locate out the unused software that can be deleted. Also, with the reachable records we can consolidate the wide variety of software providers in use and take some action to limit if any needed. The key to employ it is to function a thorough cost-benefit analysis of making SAM an innate factor of its commercial enterprise model, to gauge



software prices in terms of investment, renewal and meeting regulatory compliances. After all, the thought of each business is to justify its ROI.

## **Recommendations on ServiceNow capabilities and industry best practices**

### **ServiceNow Capabilities**

The insurance industry is one of the sectors that are modernizing very fast as per the technological advancements being experienced almost daily which has necessitated the different information technology (IT) firms to create systems that can help in having good work plans. Through the use of Insurance companies need to track their data efficiently using a dashboard with easy to read metrics which allow employees to visualize necessary data all in one place. This allows the company to know what payments are pending and what claims are incoming. Having the right dashboard enables an insurance company to operate reliably and efficiently since it ensures that the company can balance short-term risks and long-term rewards. This contributes to the success of the business.

### **Industry Best Practices**

In this new world, enterprise IT professionals are beginning to think about a strategy for integrating and consolidating data gathering and information resources in order to more fluidly support advanced analysis and automation. This is where the IT Infrastructure Library (ITIL) concept of the CMDB comes in.

ITIL provides guidance, training, and documentation on critical IT processes for enterprises seeking a more service-centric approach to management. ITIL's clear focus is on clarifying critical processes, and even more importantly, their interrelationships. The CMDB as envisioned by ITIL is first and foremost an enabler, not an end in itself. It is designed to enable efficient and collaborative processes in support of IT Service Management (ITSM).

**ITIL - ServiceNow**

ITIL provides processes for three service concepts: design, transition, and operation.

<b>Service concept</b>	<b>Processes</b>
<b>Design</b>	<ul style="list-style-type: none"><li>• service level management</li><li>• availability management</li><li>• capacity management</li><li>• supplier management</li><li>• service catalog management</li></ul>
<b>Transition</b>	<ul style="list-style-type: none"><li>• change management</li><li>• knowledge management</li><li>• asset management</li><li>• configuration management</li><li>• release management</li></ul>
<b>Operation</b>	<ul style="list-style-type: none"><li>• request fulfillment management</li><li>• event management</li><li>• incident management</li><li>• problem management</li><li>• facilities service automation</li></ul>

Process	Supported Functions
Incident Management	Incidents can be prioritized more accurately based on the relationships between affected CIs. Incidents can be resolved faster, because the entire CI information for each user is visible.
Problem Management	Detailed information for problem analysis is available.
Change Management	Supports the analysis of potential ramifications to the production environment after changes take place.
Release Management	Availability of information for release planning and execution, so that rollouts do not have a negative effect on the business.
Configuration Management	The CMDB is the database in which the IT infrastructure is recorded and described, delivering a detailed model of the IT infrastructure for all processes.
Service Level Management	Availability of information about the CIs that support an IT service. Without this data, SLAs cannot be thoroughly created and adhered to.
Financial Management for IT Services	CI information is enhanced by financial data, which is necessary for the cost and service billing.
Availability Management	Measures and controls the availability of the Configuration Items and the delivery of information to identify weak points.
IT Service Continuity Management	Based on the CIs, emergency contingency plans and baselines are created, which should be available at an alternative location.
Capacity Management	The CMDB delivers information for capacity planning.
Security Management	The CMDB includes classifications from security management for trustworthiness, integrity and availability, and provides information for risk management.

### Best Practices in Identification Design

In addition, it is best practice to group all discovered attributes together, make the fields read-only on user interface forms, and provide a date/time stamp for when the data was collected by the discovery tool and the name of the discovery tool which performed the discovery. The time/date/source information will prove to be critical for people who are using the CMDB for

decision support to manage risk. For example, knowing that discovery data in the CMDB about a specific CI is five days old may impact their decision-making process.

### **Best Practices in Control Design**

ITIL defines configuration control as “the activity responsible for ensuring that adding, modifying or removing a configuration item is properly managed—for example, by submitting a request for change or service request.” Notice configuration management practices do not mandate any specific requirements for how changes are made to your CIs, other than to say your organization should be satisfied that your controls meet your operational requirements. That leaves a lot of room for variation, allowing your organization to implement change mechanisms that are cost-effective and a value-add. The Institute of Configuration Management advocates a best practice, stating that your goal should be 80% of changes take the form of a “fast path” process. For a variety of reasons, ServiceNow customers do not always build and maintain service maps for every CI. This can be likened to a CMDB containing an inventory of CIs which are managed via Change Management. ServiceNow advocates the position that there is a key difference between a CI being under configuration control versus a CI being under change management. From ServiceNow’s point of view, by definition, configuration control requires proactive management of changes (including dependencies) and change management does not. After all, the word “configuration” is defined as “an arrangement of parts.” To restate, if there is no management of relationships, there is no configuration control. ServiceNow recommends using the **Propose Change** feature within ServiceNow Change Management to bring a CI under configuration control. The propose changes feature must be the only method allowed to update the data for a CI using the normal user interface while the CIs are deployed into “production” (i.e., actively

deployed in support of a defined business or IT service). No CMDB user (not even the Configuration Manager) has permissions to directly “edit” data using the normal user interface if a CI is under configuration control. (Of course, changes with an approved Request for Change can use other update capabilities, besides Proposed Changes, such as an import set to introduce changes.) This is not to say that a CI is not under change management at all times, but the best practice is for CIs deployed into “production” to be under configuration control.

### **Managing proposed changes**

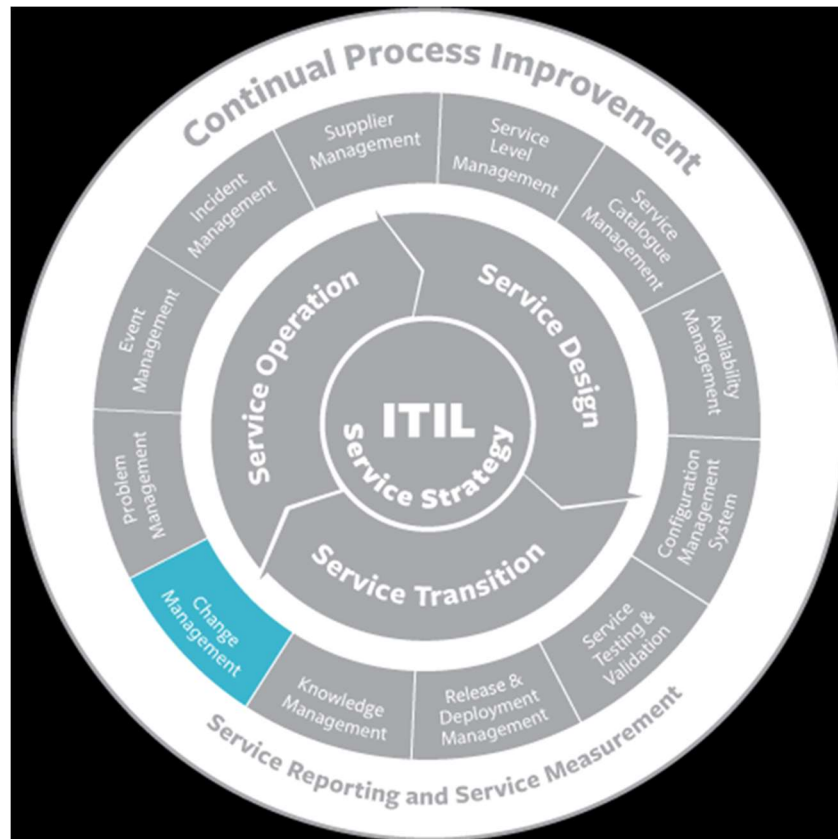
The proposed changes feature allows you to pre-configure changes to configuration items and their associated relationships. These pre-configured changes are prepared to be implemented, but do not actually happen until they are applied at a later time. When you view a CI, the proposed changes can be displayed so that you can see what is planned. This feature is useful when you want to make modifications while a change process is in the approval stage, and only implement the changes after the approvals are complete. If the change is never approved, no changes to records will be reversed. If the change is approved, a quick command applies all the proposed changes.

You can make the following proposed changes to a CI:

- Modify any field on the CI form.
- Add or delete a relationship to that CI.

To modify a relationship, you must delete the current relationship and add a new relationship.

You cannot delete a proposed change.



### **Best Practices in Verification and Audit Design**

When designing your CMDB, best practice is to define these rules at the same time you are identifying the attributes and the structure of your service maps. This effort should not be an after-thought! ServiceNow recommends identifying resources to develop and test auditing rule scripts when planning a structured effort to implement/improve the CMDB.

### **Best Practices for ServiceNow – General Tips**

#### **1. Understand that your CMDB is an IT intelligence goldmine.**

Your organization's IT resources are constantly expanding. The days of managing a few discrete systems are long gone. Now, IT leaders must keep track of servers, cloud services,

software, mobile devices, network infrastructure, and a dizzying array of end points, from PCs and laptops to tablets, smartphones, and smart watches.

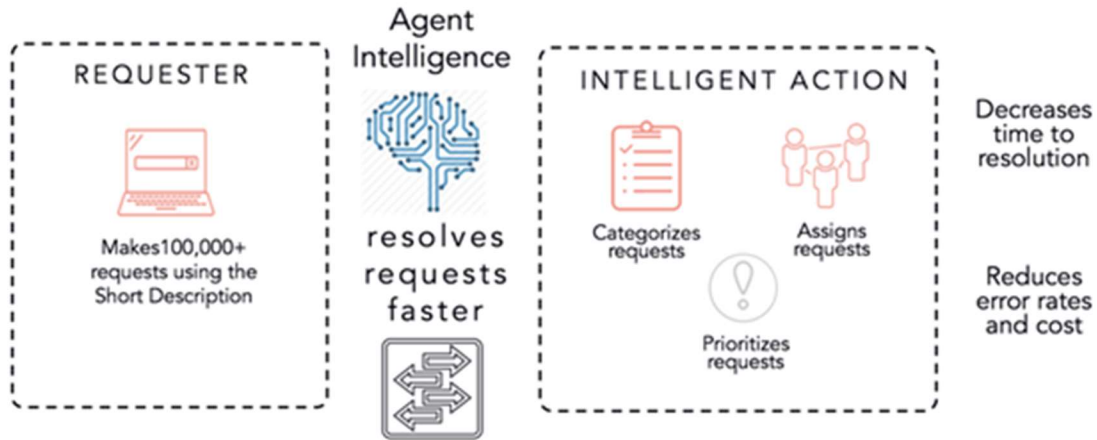
**Action item:** Add intelligence to CMDB.

While CMDB software will help you map out your IT and service ecosystem, it is important to add an additional layer of intelligence, one which maps alerts back to what generated them and why, so your Operations team can better, and more quickly understand root causes and reduce MTTR.

### **Agent Intelligence**

Agent Intelligence is embedded and available within the ServiceNow platform and uses supervised machine learning to automate prediction of fields like category and assignment group for incidents and cases. Rather than manual triaging of tasks like IT incidents and Customer Service Cases or relying on assignment rules which have to be created and managed manually – Machine Learning automates this process by learning from data. Agent Intelligence allows configuration and easy deployment of machine learning solutions by business users rather than requiring specialized data scientists to operationalize this. Supervised machine learning requires that sufficient historic data exist with examples of different classes (categories, assignment groups etc. that have to be predicted), so that they can be used for training the solution.





## Benefits

Automatically categorize tasks using the power of machine learning and your historical data. Once categorized, each request is directed to the correct agent, eliminating time spent manually triaging and reassigning issues. Finally, business-critical cases are automatically prioritized to increase agent resolution time and customer satisfaction.

- Decrease resolution times and errors through accurate classification and assignment predictions
- Increase agent productivity by saving time spent manually identifying major incidents and issues
- Surface similar incidents, cases, and alerts to predict new major incidents and recommend critical actions.
- Use real-time insights on categorization and routing accuracy to continually improve service levels.

In the Appendix, there is the relationships between the Agent Intelligence with Customer Service Management, IT Service Management and Custom Applications.

## Virtual Agent

ServiceNow Virtual Agent is an enterprise chatbot solution native to the Now Platform that enables MAPFRE to resolve common requests, increase customer satisfaction, and keep agents focused on what matters.

### Benefits

- Improve service by providing customers and employees instant answers through 24/7 automated support
- Reduce agent workload by resolving common requests so your employees can spend more time on complex inquiries
- Scale business efficiency by lowering costs and handling higher volumes of routine tasks

## 2. Zoom out to see the big picture.

Your CMDB contains everything you need to understand your business services: how they relate to critical infrastructure, how devices and apps are configured, and what state they're in. Wouldn't it be nice if your monitoring alerts were intelligently categorized and routed based on real-time awareness of the health of those services?

**Action item:** Make alerts service-aware by integrating monitoring with your CMDB. Map nodes, metrics, and checks to the infrastructure and services they impact.

## Legacy Notify

Legacy Notify enables organizations to send notifications using text and voice messages. It also allows conference calls between ServiceNow users to enable quick communications. When Legacy Notify is active, you can configure ServiceNow to automatically generate and send

notifications to selected contacts, for instance when a new incident communication plan is raised in the incident communications management process. Legacy Notify has been implemented for use within Incident Communications Management.

### **3. Use that knowledge to drive change.**

The promise of closed-loop change management and a real-time CMDB begins with listening and responding to health of services that are uniquely provided by monitoring beacons.

**Action item:** Test-drive monitoring tools that add intelligence to your CMDB.

#### **Baseline CMDB**

CMDB baseline provides capabilities that help you understand and control the changes that have been made to your configuration items (CIs) in the CMDB.

- You can create a baseline, which is a snapshot of your configuration items in the CMDB. You can review the changes that have been made to that configuration item since a previous baseline. Multiple baselines may be created and the system tracks the changes that have been made per baseline.

Creating a baseline captures the attributes of the CI as well as all first-level relationships for the CI. Any changes to the base CI or to any related CIs are captured and displayed. Newly created CIs are not automatically added to a baseline.

- Associate a configuration item with a task, a change or change task, and to propose changes to the CI after the change is complete. You can record changes, and these changes are not applied to the CI immediately but are delayed until the change is complete.

When the change is complete, you can choose to apply the proposed changes which makes all changes previously proposed and associates the changes with the task.

### **Display baseline differences**

You can see the changes that have been made to a CI or any first level related CIs by configuring the CI form layout to display the CMDB Baseline diff field. This field is labeled Baseline differences on the form.

### **Best practices for ServiceNow Discovery**

Deploying the Discovery application within ServiceNow environment consolidates multiple data sources into one, single source of record, improving transparency, uptime, efficiency and server tracking.

- **Know and understand the phases of Discovery.**

Just remember **P.C.I.E**: port probe (what technology is this device using?), classification (what type of device is this?), identification (which CI is this in the CMDB?) and exploration (what other information can we get and what relationships does it have with other devices?)

- **Keep schedules small.**

You need to keep Discovery schedules small so that they don't create a bottleneck in the queues. To do this, split schedules up by logical groupings of network components or make them location-based to take advantage of location tagging.

- **Recognize the importance of MID Servers.**

MID Servers are a critical component of Discovery – when used effectively, they can minimize traffic over WAN circuits, address geographic and network constraints and much more.

- **Find and address issues.**

Regularly explore the Discovery Status DEVICES tab in order to find and address issues as soon as they surface.

- **Read and manage ECC Queue entries.**

Learn how to read and manage ECC Queue entries and understand what they mean. Create a custom ECC Queue related list while you're at it.

- **Work closely with Network and Server teams.**

Plan to work closely with your organization's Network and Server teams so that you can quickly and easily address any Discovery Status issues.

- **Extend Discovery with custom probes.**

When extracurricular data is required, extend Discovery by using custom Process Classifications, Application Profile Discovery (APD) and other custom probes and sensors. Rather than turning off Discovery probes, teach people how to sort and filter.

- **Maintain and “sell” data.**

Discovery is not a “set it and forget it” tool. Discovery is directly connected to Configuration Management and, in order to be done correctly, you must regularly maintain and “sell” data to key groups within the organization.

- **Don't neglect logical CI to physical CI relationships.**

The real value of Discovery is in the logical CI (business service, enterprise application) to physical CI (servers, network infrastructure) relationships. Pay close attention to the creation and maintenance of these relationships and consider implementing APD to help.

- **Break up the schedule.**

Break the schedule up into two or three subnets per day and run scans Monday through Friday at lunchtime when most users are away from their desks. This will minimize the impact on the network and help you pick up mobile user machines. Consider tools like the Help Desk Login Script.

### **Other Best Practices**

Owing to the risky nature of their work, the insurance industries have significantly invested in new technologies to help them serve their customers better while still minimizing the losses incurred through false allegations or reports. Some of the leading techniques already being used in the insurance sector include data analytics, cybersecurity, mobile location data services, blockchain, artificial intelligence, wearables, and drones. To enhance competitiveness, your company should consider using these technologies.

### **Data Analytics**

When designing the dashboard for an insurance company, it is essential to know how the type of data that will be used in the company and how to use it in concluding (Agababa, 2017). Through the dashboard, the company can collect essential data that it can use in improving their services and in quickly attending to the chronic issues that have for long derailed the growth of insurance companies. Some of the ways data analytics has continued to transform the insurance industry

include customer-centricity, prevention, and reduction of fraud and wastage, help to price the premiums and allow policies to be self-servicing.

### **Cybersecurity**

The insurance companies also use the technology of cybersecurity as a way of safeguarding their systems against ransomware, data breaches, and other attacks. Despite the online platforms such as apps and the websites having a well-designed dashboard and other features, the threats of the personal and company data being illegally being accessed by external parties can ruin the performance of the company (Brubaker, 2018). Thus, like other companies, the insurance industry has invested in the cybersecurity industry which has steadily been growing. So far, this has prevented many cyber-attacks and increased the confidence of the clients as their valid claims can be addressed efficiently and transparently thereby attracting even more customers.

### **Mobile Location Data Service**

Further, insurance companies have been using mobile location data services for various reasons while offering their services. One example is, through the apps or website developed by the insurance company, it can be required that health care clients make their claims online while still at the health facilities as their claims are better supported by the location evidence. Secondly, the insurance company can use the location of their clients so that the in-apps can only show only the information relevant to their location (Carto, 2017). Inarguably, the use of localized landing for the services offered online ensures that the companies' websites remain relevant and survive in the competitive world of rapidly advancing mobile app technology. When clients move from one place to another and still need to access the same app for the insurance company, it would

appear important if they could be viewing the services being offered in their current location but still have the freedom to access the apps in their former position. Also, personalized customer service experience is a meaningful, perfect and easy way of upselling to the customers.

### **Blockchain**

The insurance companies have also embraced the technological differentiators such as the blockchain which has potentially impacted on the insurers and their customers by lowering the cost of administration, preventing fraud, assessing and tracking of assets in the business and introducing new forms of insurance (Brenchley, 2019). The blockchain has also expedited the creation of policies and processing of claims, streamlined the interaction routines, and prevented potential risks, able to offer the casualty and property insurance, introduced reinsurance, parametric insurance, parametric insurance, and micro-insurance services into their companies.

### **Artificial Intelligence**

On the other hand, the insurance companies have also invested in artificial intelligence in seeking out patterns that could only be identified by the most experienced underwriters (Balasubramanian, Libarikian, & McElhaney). Nowadays, the artificial intelligence has been much used in reporting claims on First Notice of Loss (FNOL), made it easy to make an investigation of claims, enhanced the estimation of losses for reduced claim leakages, detection of frauds using supervised and unsupervised machine learning after the unstructured data is harnessed and analyzed.



## **Wearables**

Insurance companies have also turned to the use of wearables to collect valuable information that can then be accessed through the dashboard of their website dashboards. Using the wearables, insurance companies can now find better ways of preventing accidents in high-risk industries as the workers can be adequately advised on how to conduct their duties (Draper, 2018). It is estimated that by 2020, more than 75 million wearables will already be in use at the workplaces. The rate of use of wearables has quickly been rising.

## **Drones**

The use of drones has helped insurance companies in several ways. First, the drones assist in the collection of information such as the conditions of roofs and other property that may be difficult to access both at the stage of underwriting the insurance policies and during claims (Bonner, 2018). When a client takes policy, a personal account for them is created in the websites of the insurance company, such initial information uploaded into the clients' profiles in a systematic way summarized in a dashboard becomes very vital in future. The use of drones has made it possible to collect accurate and quick assessments thereby shortening the timeframe for the claims and still creating a competitive insurance industry.

Secondly, the use of drones allows more precise risk management and tailored pricing further increasing the competitiveness and making it possible to process personalized premiums that correspond to the actual risk. Thirdly, drones have been used to dramatically lower the losses that insurance companies have incurred as a result of fraud. As expected, the insurance companies receive many different claims daily, and it is their role to assess and determine those that existed before the event occurred. This confirms the importance of the imagery by the drones as they can

successfully protect themselves from any damages being wrongly claimed while they existed before the underwriting. Also, the use of drones has done away with many legal struggles that the customers and the companies undergo as each seeks to prove its point. With just a touch of the keyboard, the video recorded taking the initial condition of the property can be played from the dashboard of the customers as uploaded by the admin.

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**APPENDIX A – Project Charter**



# School of Professional Studies

## Project Charter

### MAPFRE ServiceNow

### CMDB Assessment

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## **Glossary of Terms in a Project Charter**

This glossary defines key terms used in this document. Although some of the terms will have slightly different definitions outside of this project, this glossary defines the meaning within this initiative.

**Assumption** – An item taken to be factual even though that fact has not been confirmed. Wherever possible the accuracy of assumptions is validated during the project

**Constraint** – An unchangeable condition that impacts the project.

**Contingency** – An activity, budget or time period that is held in reserve in order to minimise the impact that a risk has on the project if that risk is realised

**Major Stakeholder** – One of the key interested parties and decision makers in the project.

**Mitigation** – An activity that is undertaken to minimise the impact and /or the likelihood of occurrence of an adverse risk or to maximise the impact and /or the likelihood of occurrence of a positive risk

**Project Charter** – This document. The document that authorises the project and sets out the framework for what is to be done and how it is to be managed.

**Project Manager** – The person responsible for the management of the execution of all work items.

**Required End State** – The definition of what constitutes a completed project.

**Risk** – An uncertainty that may impact the project in either a positive or negative manner if it occurs.

**Scope** – The sum of the changes to be made in order to achieve the Required End State.

**Steering Committee** – The group of people responsible for making major decisions on the project.

## 1 Project Overview

### 1.1 Introduction

The objective of this project is to gather requirements , review objectives from the MAPFRE Insurance and to recommend them the best solutions to make their IT infrastructure secure and resilient .During the time period beginning from February 2019 to April 2019, MAPFRE Insurance in conjunction with Clark University – SPS students' group, will establish a team to review the ServiceNow Configuration Management Database (CMDB) and will provide recommendations on the existing CMDB configuration, roadmap, utilization, and data model. In addition to reviewing the current CMDB environment, Clark Capstone students will provide an overview of industry standards, best practices, and proven methodologies taking into account the current state of the MAPFRE ServiceNow CMDB.

### 1.2 Major Stakeholders

- Dean Cascione
- Angelos Spetseris
- Helen Loveless-Coburn
- Michel Jasmin
- Julie Jaynes
- Richard Aroian

### 1.3 Document Purpose

- *The desired end state:* This includes the achievable end results of the Project
- *The project scope:* This includes what our team is going to work on.
- *Assumptions, constraints, and risks:* This defines the assumptions, constraints, and risks associated to achieve the scope.

- *Communications and structure:* This includes meetings of the team members with the stakeholder and the project plan.
- *Roles and responsibilities:* This section defines roles and responsibilities taken during the project by the team members.

## 2 Project End State and Scope

### 2.1 Required End State

In the end, the team will also provide their views on reviewing the existing data sources, processes for populating CMDB along with CMDB Health Dashboard configuration and utilization. At the end of this project the Clark MAPFRE team will document their findings in the CMDB design, data model, dataflow into and within CMDB, CMDB roadmap, ServiceNow Capabilities with recommendations and two industry best practices. The team will display the presentation of the work as well as a project deliverable to the stakeholders.

### 2.2 Project Scope

Work Area	In Scope	Out of Scope
Review existing data sources and processes for populating the CMDB	Reviewing the existing data sources for populating the CMDB	If the system has unified monitoring with CMDB
Review existing Asset Onboarding, Asset Retirement, and Management processes		Review existing Asset Onboarding, Asset Retirement, and Management processes

<p>Review CMDB Health Dashboard configuration and utilization</p>	<p>Review of MAPFRE CMDB Health dashboard configuration and provide recommendations to ensure that MAPFRE CMDB remains accurate and relevant in terms of Completeness, Correctness, Compliance, and Relationships of all Configuration items. This will help that CMDB dashboards display CMDB health reports correctly and will help to configure the CMDB health KPIs and metrics that Configuration items are evaluated for.</p>	<p>CMDB health KPIs and metrics Configuration and implementation.</p>
<p>Provide recommendations on CMDB design</p>	<p>Providing recommendations on Design and UI of CMDB</p>	<p>Implementation of the recommended changes</p>

<p>Provide recommendations on CMDB data model</p>	<p>Data model analysis and give recommendations for different aspects.</p>	
<p>Provide recommendations on managing data flow into and within the CMDB</p>	<p>A brief summary of some basic best practice recommendations on how to more efficiently manage the data flow into and within MAPFRE CMDB. These may include reorganization of data, communication channel, import/export strategies, or use of a different data management software tools and framework.</p>	<p>A full working solution or software tool for data flow management into and within CMDB.</p>
<p>Provide recommendations for industry best practices</p>	<p>Focus on ITIL Framework that includes incident, change, configuration, security management following guided processes for continual</p>	<p>Implementation of recommended best practices</p>

	improvement in service strategy, service design, service operation, and service transition.	
Provide recommendations on CMDB roadmap taking into consideration existing data sources	<p>Recommendation on Software Asset Management, Data Security, and Vulnerability tools to secure network infrastructure as per NIST standards.</p> <p>Recommendation on the latest cybersecurity attacks list and techniques to protect intellectual property from unauthorized access and cyber attacks.</p>	Implementation of recommended security controls
Provide recommendations for ServiceNow capabilities	Allow the company to change the CIs strict and flexible access control	The ability to support cross-cloud environment

## **Change Management**

During the project timeline, all the requests to modify the established and agreed scope will be performed through the change management process. If there is a change in any of the modules in the project that needs to be documented and signed by all the Project stakeholders and notified to the team. It is an important function which will ensure that the changes proposed are the correct ones and that the impact of the changes is understood and allowed for.

### **3 Assumptions**

The following things will be assumed by the team at the start of the project:

- We will get all of the application related resources that we need to deliver the given objectives
- Team members are provided with a training module to work on.
- We will have a demo meeting with a client about the modules in the project
- No unnecessary information will be requested by the Clark MAPFRE team
- Clark University Team of students will deliver appropriate recommendations to MAPFRE which will provide them positive outcomes from the project.
- We can have Technology support to complete this project.
- Clark University Team of students will work in a group of seven and deliver the requirements on time.
- Clark University Team of students will keep the MAPFRE team and Project advisor updated about the status of the project.
- We can finish this project on time.
- All of the important stakeholders can participate in every meeting.



#### 4 Constraints

The following constraints are related to this project:

- The sensitivity of Data: Since the company deals with Insurance and personal information, the data is very sensitive, and we would not have access to most of the Real-time data.
- Timeline: The desired end date of the project would be 15th April
- Team meetings: Traffic inconvenience limits the number of people from a distance.
- Cannot finish this project on time

#### 5 Risks

Below are the known risks which could have an impact on the outcome of the project and associated strategies that MAPFRE will take to manage them. The initial and future risks will be logged and maintained in the Risk Management Plan.

- **Negative Risks**

- Project start date
- The risk of a late start.
- Delays to required infrastructure
- Delays to infrastructure such as software credentials.
- Integration testing environments are not available.
- The risk that environments will not be available for test penetration.

- **Positive Risks**

- If the client starts implementing recommendations, they might have to expand their systems and the whole infrastructure in the near future, in general, would require a more advanced information system architecture and plan.

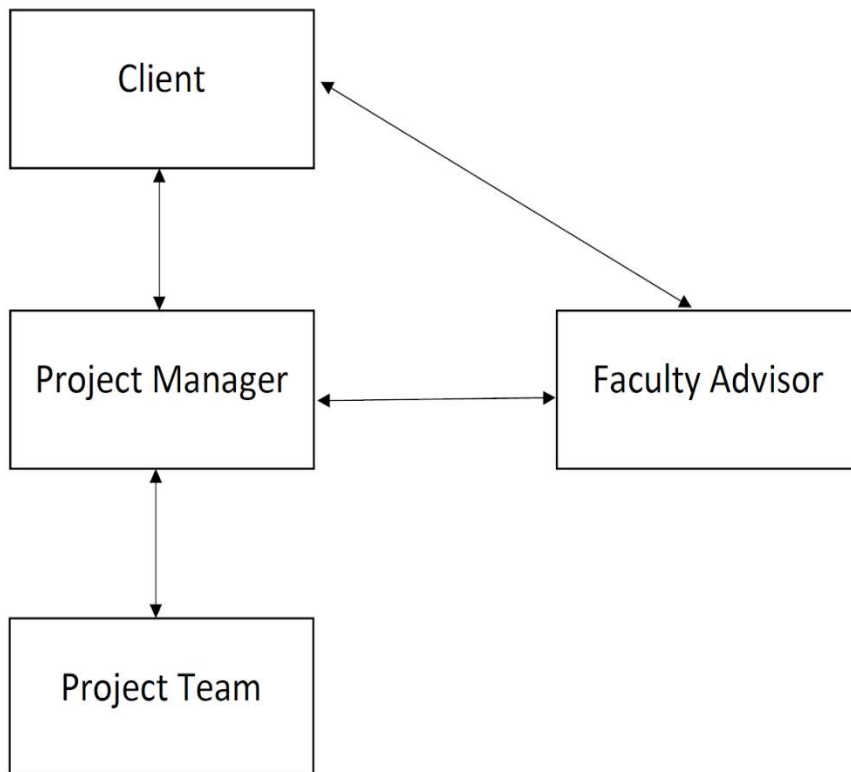
#### 6 Communication Strategy

Communication strategy of the project will be:

- Email - Involves the Clark Capstone Team sending periodic emails to the project stakeholders and the managers. An email may be sent to inform everyone of the project progress or even request for a requirement.

- Skype Calls - Use of Skype is another communication strategy that will be used to reach the project team members or stakeholders. Skype is more efficient when a person involves far away or outside the country.
- Weekly meeting - Weekly meetings of the Capstone Team. Also, weekly meetings with the Advisor, where we update the project status. Technologies used for meetings are Skype, WhatsApp, Google Drive, and SharePoint.
- Conference call - Small conference call meetings with the client for further information.
- Monthly progress - Project team leader may send project progress reports. These reports communicate to the leaders of the constraints the project is undergoing or what resource is required for the completion of the project.
- Informal communication
- Monthly status to the client

## 7 Project Structure



**8 Steering Committee and Stakeholder Commitments**

**8.1 Steering Committee (If applicable)**

N/A

**8.2 Stakeholder Commitments**

By signing this document, stakeholders commit to the below points:

- Agreement of all stakeholders is required before making any changes to the terms laid out in this charter.
- All decisions, sign-offs, etc. requiring agreement must be made within three business days of submission. Similarly, if a stakeholder is unavailable to provide approval this must be communicated within three days and the stakeholder must name an alternate or agree to allow the other stakeholders to make decisions on their behalf.

**9 Roles & Responsibilities/RASCI Chart**

**Responsible** – The role(s) that is expected to complete the work

**Accountable** – The role that is expected to ensure that the work is completed

(escalation point)

**Sign-Off** – The role(s) that is expected to approve the work

**Consulted** – The role(s) that is consulted on/contributes to the completion of the

work

**Informed** – The role(s) that receives the output of the work and/or receives

status reports on the progress of the work.

Roles / Responsibilities
--------------------------

	Project Management	Project Execution	Faculty	Client
Project charter including end state and scope	R,A,S	C,I,S	C,I,S	S
Project management and control	R,A	C	C	C
Project communication	R,A	C,I	C	C
Project planning	R,A	C	C	C
Resource allocation	R,A		C	I
Problem identification and analysis	A	I	R	C
Problem resolution	R,A	C,I	C	C

10 Measures of Success

<b>Project Performance Dimensions by Project Success Factor</b>	
<b>Project Outcomes</b>	<b>Measure of Success</b>

Project meetings	<ul style="list-style-type: none"> <li>● Timely meetings</li> <li>● Successful discussion of agenda</li> <li>● Execution of the meeting agenda</li> </ul>
Adoption of Technical and Functional recommendations	<ul style="list-style-type: none"> <li>● Improvement in IT capabilities ensuring provided solutions will resolve complicated technology needs.</li> </ul>
Unity of the project team	<ul style="list-style-type: none"> <li>● Team members remained united in their discussions</li> <li>● Team members remained motivated.</li> </ul>

**11. Stakeholder Sign-off**

This project charter has been signed off by the following stakeholders:

Name	Title	Date
Name	Title	Date
Name	Title	Date

Name	Title	Date
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Name	Title	Date
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Name	Title	Date
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Project Teams Members:

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Name	Title	Date
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Name	Title	Date
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Name	Title	Date
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## **APPENDIX B – ITIL**

### **ITIL (IT Infrastructure Library)**

ITIL provides guidance, training, and documentation on critical IT processes for enterprises seeking a more service-centric approach to management. ITIL's clear focus is on clarifying critical processes, and even more importantly, their interrelationships. The "Configuration Management Database," or "CMDB," is a term and concept that was defined and developed by ITIL. According to ITIL, the CMDB should: "...hold the relationships between all system components, including incidents, problems, known errors, changes and releases. The CMDB also contains information about incidents, known errors and problems, and corporate data about employees, locations and business units. In addition, the CMDB is often used ... to hold details of services and to relate them to the underlying IT components ...[and] ... to store inventory details ... such as supplier, cost, purchase date, and renewal date for a license." The CMDB as envisioned by ITIL is first and foremost an enabler, not an end in itself. It is designed to enable efficient and collaborative processes in support of IT Service Management (ITSM).

Two ITIL concepts central to the CMDB are "configuration items," or "CIs" and "libraries." A CI is the record of the IT element (system, network, application, etc.) or business-related entity stored in the CMDB, while a library is "a collection of software or document CIs of known type and status." So, how does ITIL relate to the CMDB? In short, the CMDB becomes for ITIL a trusted resource for assuring consistency and efficiency across many IT disciplines in support of IT Service Management (ITSM). ITIL does not in any way deal directly with architecture or architectural issues—it is one hundred percent devoted to IT process. ITIL provides the top-down view of processes (the "what" not the "how") and the CMDB provides the foundation upon which advanced IT functions are built. The CMDB is, in fact, a concept not necessarily



greater or smaller than its parent, ITIL, but in the “real world” represents an overlapping circle where architectural evolution and best practices come together.

ITIL guided processes initially include:

- Document and make policy; methods to support the enforcement of standardized procedures across the enterprise (People, Process, Technology) for the entire Asset Lifecycle. Processes should include changing, updating, recording, tracking and verifying CIs as well as eliminating invalid and unauthorized changes
- Determine required metadata, roles, and access restrictions to support the processes defined above
- Populating all the Physical Infrastructure (Discovery)
- Populating key (if not all) relationships for the physical infrastructure (Discovery - Automated)

The IT Infrastructure Library best practices standards include specifications for configuration management. According to ITIL specifications, the four major tasks of configuration management are:

- Identify CIs to be included in the CMDB (discovery)
- Control data to ensure that it can only be changed by authorized individuals (security)
- Maintain status, which involves ensuring that current status of any CI is consistently recorded and kept updated (reporting)
- Verify through audits and reviews of the data to ensure that it is accurate (auditing)

## Why is ITIL so successful?

ITIL embraces a practical approach to service management - do what works. And what works is adapting a common framework of practices that unite all areas of IT service provision towards a single aim - that of delivering value to the business. The following list defines the key characteristics of ITIL that contribute to its global success:

- **Vendor-neutral** - ITIL service management practices are applicable in any IT organization because they are not based on any particular technology platform or industry type. ITIL is owned by the UK government and is not tied to any commercial proprietary practice or solution.
- **Non-prescriptive** - ITIL offers robust, mature and time-tested practices that have applicability to all types of service organization. It continues to be useful and relevant in public and private sectors, internal and external service providers, small, medium and large enterprises, and within any technical environment. Organizations should adopt ITIL and adapt it to meet the needs of the IT organization and their customers.
- **Best practice** - ITIL represents the learning experiences and thought leadership of the world's best-in-class service providers.
- **Positive ROI** - ITIL is successful because it describes practices that enable organizations to deliver benefits, return on investment and sustained success. ITIL is adopted by organizations to enable them to:
  - Deliver value for customers through services
  - Integrate the strategy for services with the business strategy and customer needs
  - Measure, monitor and optimize IT services and service provider performance
  - Manage the IT investment and budget

- Manage risk
- Manage knowledge
- Manage capabilities and resources to deliver services effectively and efficiently
- Enable adoption of a standard approach to service management across the enterprise
- Change the organizational culture to support the achievement of sustained success
- Improve the interaction and relationship with customers
- Coordinate the delivery of goods and services across the value network
- Optimize and reduce costs.

ITIL provides processes for three service concepts: design, transition, and operation.

### **Service Design**

- Service level management

The service level management process is designed to ensure customer satisfaction within IT service processes. Service level agreements are made between the IT staff and the customers, and the IT desk must monitor their performance as compared to the agreements. In addition, underpinning contracts with external vendors and operational level agreements with internal vendors ensures that these service level agreements are feasible.

- Availability management

The availability management process ensures that availability within a system is kept as close to 100% as possible. By both reacting to past service failures, and planning

to avoid future service failures, availability management can greatly increase end-user satisfaction with services.

- Capacity management

The capacity management process is designed to ensure that business services are not made unavailable by over-capacity. By analyzing past failures and planning for growth of demand of services, capacity management can increase end-user satisfaction with services.

- Supplier management

Supplier management is a process that defines and monitors agreements between an IT department and an external supplier.

- Service catalog management

The service catalog provides a front end for customers to request items and services. Service catalog management ensures that this service catalog provides accurate and useful information on the items and services.

## **Service transition**

This guide provides a general overview of ITIL service transition concepts and how the Now Platform can enable these processes.

- Change management

The change management process ensures that standardized methods and procedures are used for efficient and prompt handling of all changes to minimize the impact of change related incidents on service quality. Consequently, change management aims to improve the day-to-day operation of the organization. IT-related changes that may affect one or

many customers are tracked with change management. Adding memory to one machine, getting a new server, and installing the latest Windows OS on all PCs are all examples.

- Knowledge management

The knowledge management process ensures that important information flows freely throughout the IT organization. Knowledge management keeps the CMDB and knowledge base of an organization up-to-date and uses a knowledge-centered support approach to reduce repeat incidents and problems.

- Asset management

Asset management enables a process of monitoring processes, organizations, people, information, applications, infrastructure, and financial capital within an organization. This allows the organization to collect accurate records of these business components, making them available for both internal and external auditing processes.

- Configuration management

Configuration management provides a logical model of the infrastructure or a service by identifying, controlling, maintaining and verifying the Configuration Items in existence.

- Release management

This discipline of IT service management is the management of all software configuration items within the organization. It is responsible for the management of software development, installation and support of an organization's software products. Software Control & Distribution procedures include the management of the software Configuration Items and their distribution and implementation into a production environment. This involves the definition of a release program suitable for the

organization, the definition of how version control is implemented, and the procedures surrounding how software is built, released and audited.

## **APPENDIX C – Agent Intelligence**

### **Agent Intelligence**

Agent Intelligence is embedded and available within the ServiceNow platform and uses supervised machine learning to automate prediction of fields like category and assignment group for incidents and cases.

### **Agent Intelligence + Customer Service Management**

Agent Intelligence for Customer Service Management uses machine learning to accelerate case categorization, prioritization, and assignment, thus shortening response times and contributing to higher customer satisfaction. It also reduces agent manual work, freeing up resources to work on higher priority tasks.

### **Agent Intelligence + IT Service Management**

Agent Intelligence for IT Service Management automatically categorizes and routes incidents for a simpler fulfiller experience and reduces resolution times. By applying machine learning and data models to predict outcomes, Agent Intelligence reduces costs and speeds up incident resolution.

### **Agent Intelligence + Custom Applications**

Agent Intelligence can be applied to the custom applications built on the Now Platform. Categorize, assign, and prioritize work by training the model using historical data from custom apps to optimize resources and maximize productivity.