Indonesian Journal of Enterprise Architecture
P-ISSN: 3035-6410; E-ISSN: 3035-6402
Journal Homepage: http://journal.lontaradigitech.com/IJEA

Implementation of TOGAF ADM in Designing Enterprise Architecture for Netflix Company

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ARTICLE INFO

Keywords: TOGAF; Enterprise architecture; Netflix

Received: 14 Jan 2024
Accepted: 15 Feb 2024
Published: 28 Feb 2024

ABSTRACT

Netflix is a digital media streaming service provider, where business Mainly, it is a subscription streaming service that provides films and television programs, including several programs created by Netflix itself. In building a good business process and implementing the running of a system, it takes a business architecture design, using a framework architecture to minimize errors that will occur in creating a framework. EA design is needed by the Netflix company in order to help and increase efficiency regarding enterprise architecture to improve company performance and even help companies to plan and manage system changes for the company. In designing this Enterprise Architecture, a method is used, namely TOGAF ADM which consists of 10 phases. But this research is limited to 4 phases, namely, Preliminary phase, Vision architecture, Business architecture and Information system architecture.

1. INTRODUCTION

Netflix is a digital media streaming service provider, headquartered in Los Gatos, California. Netflix itself was created in 1997 by Reed Hasting and Marc Randolph in Scotts Valley. The company's main business is a subscription streaming service that provides films and television programs, including several programs created by Netflix itself.

Such sophisticated technology makes it easier to carry out daily activities, both in the world of work and in normal social life (Budiarto, 2020; Bimantoro et al., 2021). One of the best innovations that has emerged in the current technological era is the "Netflix" viewing service provider application. This American company is the company that created the world's largest viewing service provider application, which operates in almost 190 countries in the world. There are so many subscribers to this application that almost everyone has a Netflix subscription account. Netflix, as the largest streaming service provider in the world, provides streaming viewing services for films, series and various types of cartoons from various genres from all over the world.

As a business that develops in technology, which runs based on applications and web services, this streaming service provider company offers a lot of content to the public (Setiawan, 2018) . The content offered has a variety of choices that are given to customers. Customers are given various content by paying a subscription fee at the beginning and then paying it every month via the Netflix application.

Netlfix has many customers because this streaming service provider company provides a service for watching films without advertising so that it does not disturb the audience while a film is playing. Another factor is that the film series offered have full episode series updates, not one episode at a time,

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so the audience likes this. Not only that, the ease of accessing various devices ranging from smartphones, TVs, tablets, PCs and computers is an advantage in itself.

A business architecture design is needed, by utilizing an architectural scheme so as to minimize errors that might occur when preparing a scheme/framework to create a good business mechanism and implementing a system. The TOGAF framework/scheme is an option that can be selected from several methods that are widely used and well known today (Lee, 2020).

A scheme that has the advantage of being able to support work in interpreting correlations between patterns, data and humans is another definition of EA or enterprise architecture, where this scheme has been used for a long time. Another advantage of EA is that it is able to set application standards that can be used by a business and also supports when making decisions, reducing the level of expenditure when technology management is carried out (Dang & Pekkola, 2017). Then, one of the EA interpretations is TOGAF (Ulmi et al., 2020). Along with the information system, TOGAF itself shares detailed techniques regarding the formation and application of EA (Hermawan & Sumitra, 2019).

To be able to support and increase the efficiency of enterprise architecture which can ultimately expand the company's performance and even help the company to plan and manage changes in patterns for the company, Netflix itself requires the preparation of an EA, which Netflix considers this to be one of the important things.

2. METHODS

The method that our group chose/determined when they wanted to create an Enterprise Architecture design, namely TOGAF ADM, where this method consists of 10 phases. However, our group only used 4 phases to use as discussion material in this research, namely; Preliminary phase, Vision architecture, Business architecture and Information system architecture. In the Preliminary phase, we prepare a design where the direction is to determine the scope, architecture, then there are also architectural principles that are used as a design reference in accordance with what the company expects. Next there is the Vision architecture phase, this phase is expected to be able to develop an architectural vision in accordance with the desired business values. Then Business Architecture, the third phase contains business activities or the expected form of business. Finally, there is Information system architecture, which mainly talks about activities on how to develop information system architecture (Desyawulansari et al. , 2022).

3. RESULTS AND DISCUSSION

Several significant results and benefits were generated by the use of TOGAF in the design of Netflix's Enterprise Architecture (EA). Here we use only 4 phases, namely; Preliminary phase, Vision architecture, Business architecture and Information system architecture. The effects that can be obtained from TOGAF implementation are described in the following order:

3.1 Preliminary Phase

Design Preparation Techniques begin with the Preliminary Stage. At this point, the outcome is the definition of the Netflix Enterprise Architecture design scope, which includes identifying the ideal architecture and guiding architectural principles. To serve their clients around the world, Netflix's technical team created an extraordinary video streaming system with extremely high availability and scalability.

Choosing a Design Scope Netflix's EA design scope covers a number of corporate functions, including business operations, information systems, application architecture, and systems integration. This range covers all of Netflix's business activities including content management, data analysis, user experience, security and video streaming services. Desired architecture identifier, To provide scalability,

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high availability, speed of access, and effective content management, Netflix needs an architecture. Customers should be able to access the material easily and have a superior user experience of the architecture in question. These recommendations can serve as examples and Norms for Effective Enterprise Architecture Design. Table 1 The Principles Catalog, referenced below, provides the Key Concepts that influence Design.

Table 1. Principle Catalog

No.	Architecture	Principle
1.	Business	Operation For Business done with Waste as little Possible
2.	Business	Procedure Uniform Business
3.	Business , Data, Applications , Technology	Data, Application and Component Management Technology centralized. Only Data Logging is carried out .
4.	Data, Applications	One Goal, however, can applied to various Identical Data Applications
5.	Data	Every Applications that use it. Reliable Data Data sharing happens through
6.	Data	By *Real Time* and using Electronic Media
7.	Application	Easy program used
8.	Applications, Technology	IT systems include ability Authentication, so can used When just and anywhere.
9.	Applications, Technology	And Permission For decide Access Rights

Netflix runs on Amazon Web Services (AWS) and Open Connect's internal content distribution network. For both systems to provide high-quality global video streaming services, they must work together seamlessly. Netflix consists of three main components: user interface (UI), backend, and content delivery network (CDN). the desktop or laptop is referred to as the Client. To provide the best customer experience to every client and organization, Netflix develops its own iOS and Android apps. By controlling other applications and servers through the SDK, Netflix is able to provide streaming services that are transparent to the specific situation at hand, such as a slow network or an overloaded server.

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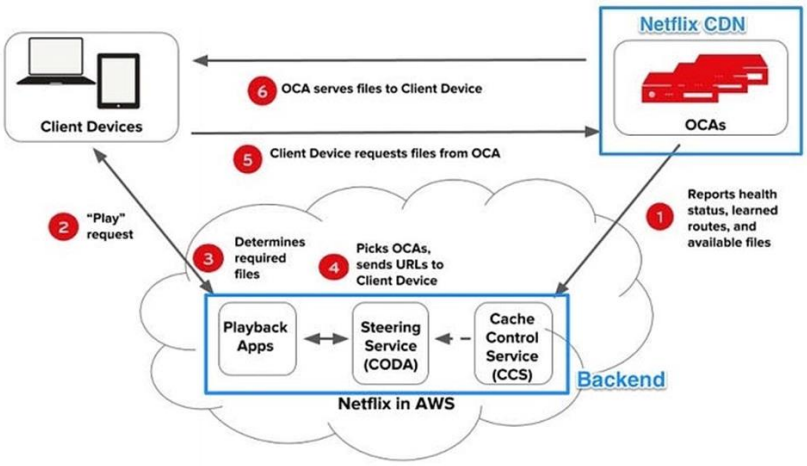

Figure 1. Architecture for video streaming playback

1) To keep the Playback Application updated to the latest healthy OCA for clients, OCA provides health updates on workload status, routing capabilities, and available video to the Cache Control service running on AWS EC2 .
2) To obtain a URL to stream a video, a Play Request is sent from the client device to the Netflix Playback Application service running on AWS EC2.
3) To view a particular video, the Playback request must be approved by the Playback Application Service. The certification will check customer packages, international video rights, etc.
4) The Referrer Service, which also runs on AWS EC2, is contacted by the Application Playback service to obtain a list of appropriate OCA servers for the requested video. .
5) The referring service determines the optimal OCA collection for the client based on the client's IP address and ISP information.
6) The client evaluates the strength of the network connection to each of the ten OCA servers listed by the Playback App service and selects the fastest and most reliable OCA to request video files for streaming.
7) The client sends a request to the selected OCA server, which receives it and starts streaming the video.

3.2 Architectural Vision

This stage leads to the creation of an architectural vision that is consistent with the goals Netflix has for its business. A long-term perspective on how EA will be developed to support the company's goals is part of this vision. In Netflix's case, this stage requires a thorough understanding of the digital entertainment market, consumer trends, and client needs. The architectural vision created will guide EA's design, allowing Netflix to maintain its competitive edge and meet customer demands.

Simply put, Netflix's business has a market and target strategy that is driven by convenience. Additionally, Netflix is reasonably priced and can be accessed by users everywhere. It only takes a few minutes for the system to suggest what clients should watch, keeping individual interests in mind. Customers can choose from three packages provided by Netflix, each of which has a 20% price difference, as well as a monthly subscription. Customers will also receive a free trial subscription for the first month. Prices range from $8 to $12 per month, with a broad target population.

Customers pay the same amount or more each month for cable TV subscriptions in most countries. By developing a service that only requires an internet connection and is affordable, Netflix saw an opportunity. Technology used by Netflix 10% of Netflix's $900 million annual sales are allocated to R&D. And as growth accelerates, this number will continue to increase over time. Netflix actively develops and

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utilizes open source. In fact, the Netflix framework is now known as the Netflix Architecture because many businesses have adopted it.

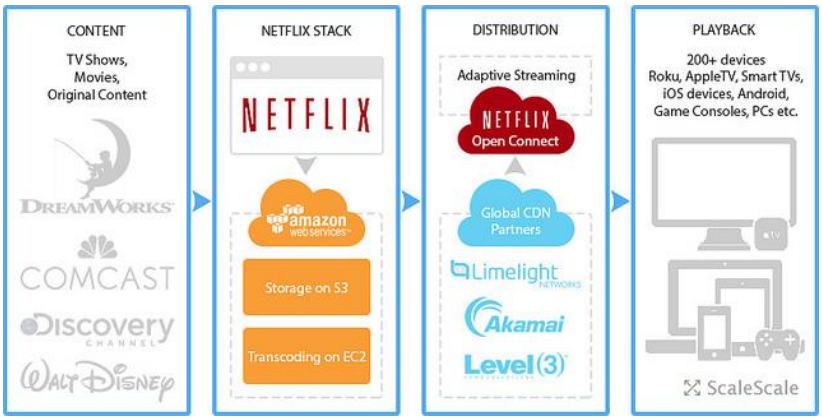

Figure 2. Netflix Technology

Modern procedures and technologies have enabled Netflix's transformation process, which has consistently elevated it to the top position among online streaming services. When it comes to display quality and user preferences, Netflix takes the cake. For many modern digital organizations, watching the transition Netflix is going through is incredibly motivating.

3.3 Business Architecture

This step will involve a thorough understanding of Netflix's internal structure, operational workflows, data requirements, and system integration. A strong business model will ensure operational effectiveness, better decision making, and the creation of systems that meet business needs.

As has been said, the big adjustment made by Netflix was to transform the company into an internet streaming service. Netflix doesn't stop there either. after significant changes. Netflix expanded its business to produce TV shows and films in anticipation of the introduction of Inc.com (2021). Stranger Things, House of Cards, Bridgerton and many other Netflix productions are among the most popular TV shows and films. It could be said that Netflix's commercial expansion was very dangerous, but Netflix was actually successful in that regard. Netflix continues to create material by including content around the world for users from other countries, so it doesn't stop there. Netflix even produces and distributes TV shows and films from various countries, including South Korea, France, the UK and others.

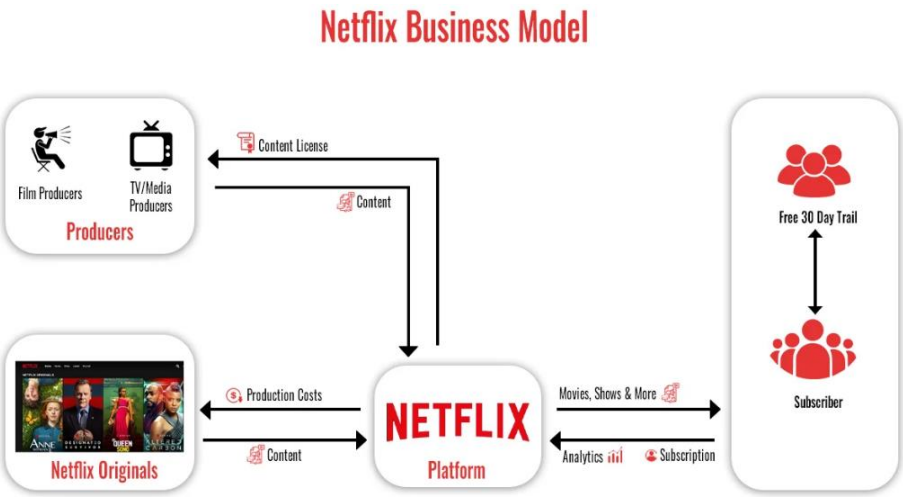

Figure 3. Netflix Business Models

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Netflix moment This become choice main for user for TV series and movie streaming. According to forutne.com, Netflix service only constitutes 15% of all global Internet bandwidth.

3.4 Information System Architecture

This step will involve a thorough understanding of data management, system integration, information systems, and infrastructure requirements required in the context of Netflix. Creating a solid information systems architecture will ensure alignment between Netflix systems and desired business outcomes. Businesses can increase operational effectiveness, improve decision making, and offer better service to customers by using TOGAF in Netflix Enterprise Architecture design.

High Level System Architecture for Netflix We are all familiar with Netflix. Users pay a monthly rental to watch the various films and television shows it handles. More than 180 million people worldwide subscribe to Netflix.

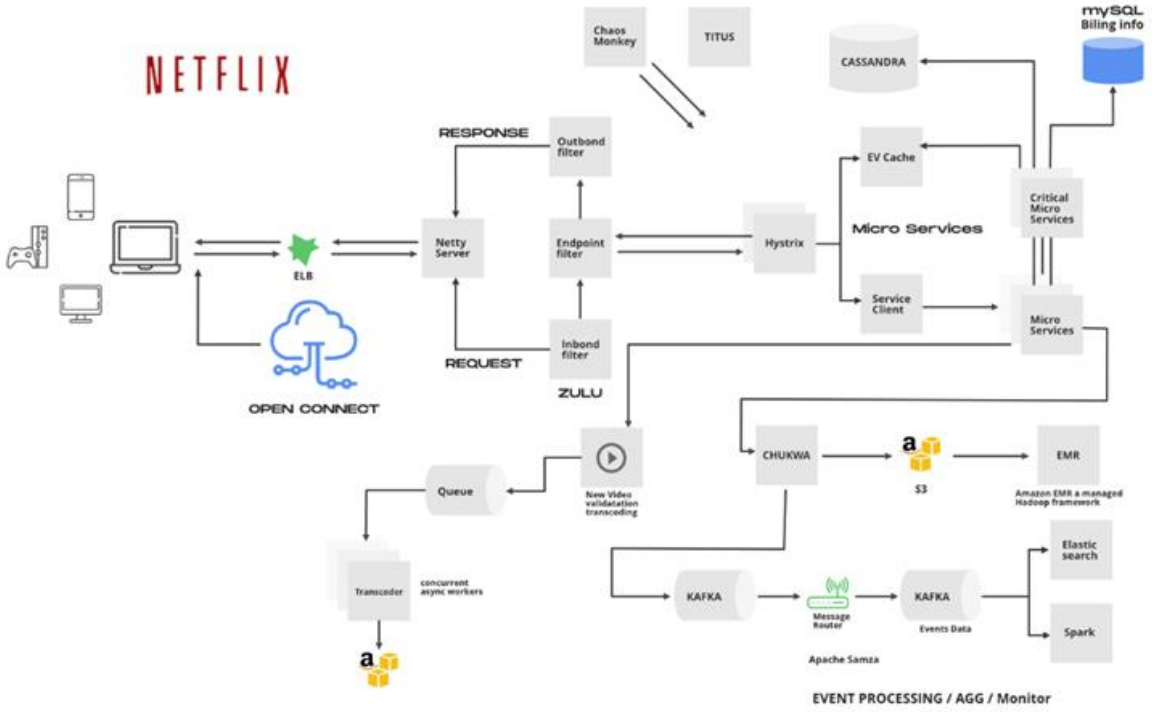

Figure 4. Netflix High Level System

AWS and Open Connect are two clouds that Netflix uses. Together, these two clouds form the foundation of Netflix, and they are critical to delivering the best video to customers. Application This generally consists of three parts, among others that is;

1) Interface user or device soft client used for browsing and play Netflix movies. Television, Xbox, laptop, devices mobile, etc.
2) Netflix or OC (Open Connect) CDN: Open Connect is a CDN (network delivery content) belongs to Netflix worldwide, which is server network spread across various geographic regions. He manages every aspect of video streaming. Once you press knob play, video stream from component this, which is spread across various place, displayed on your device. As a result, the video will served from the connection nearest open (or server). than the original server if you try turn it around moment is in North America. This will produce more response fast from the nearest server.

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3) Backend database: Before you hit rotate, components manage all activity in addition to video streaming, incl add content new, processes the video, sends it to servers around the world, and control Then cross network. Amazon Web Services handles part big operation.

For three reason keys — startup speed, runtime performance, and modularity —Netflix's frontend was written in ReactJS. Let us talk about how Netflix was created and works.

3.5 How Does Netflix Accept Movies or Videos?

Netflix obtains very high-quality content from production companies, so it processes the content before sending it to users. Each of the more than 2200 devices Netflix supports has its own unique set of format and resolution requirements. Netflix performs transcoding or encoding, which requires identifying problems and converting the original video into various formats and resolutions, to make the video visible on various devices.

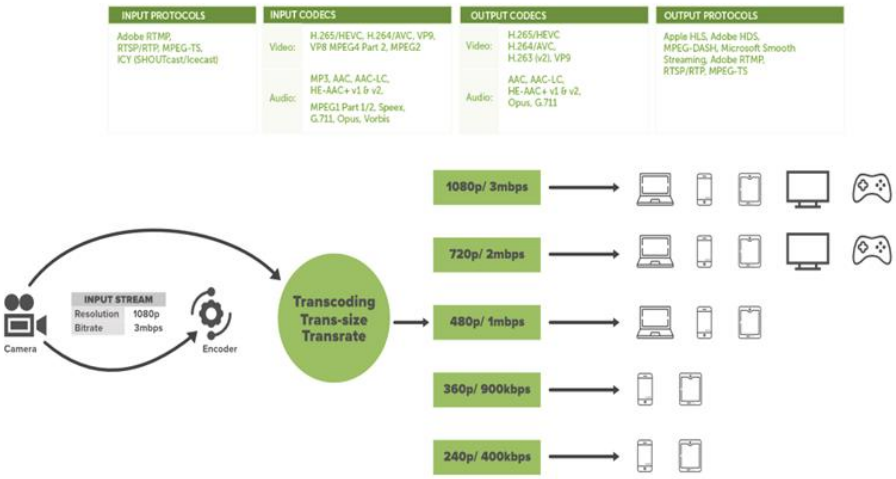

Figure 5. Transcoding

Additionally, Netflix prepares files optimized for various network speeds. When you watch videos at fast network speed, the quality is good. About 1100–1200 copies of the same video are created by Netflix, each at a different resolution. This clone requires a lot of preprocessing and transcoding. Netflix splits the original video into smaller bits, then uses AWS workers simultaneously to convert each of these smaller chunks into different formats and resolutions (like mp4, 3gp, etc.).

3.6 Architecture Service Netflix Micro

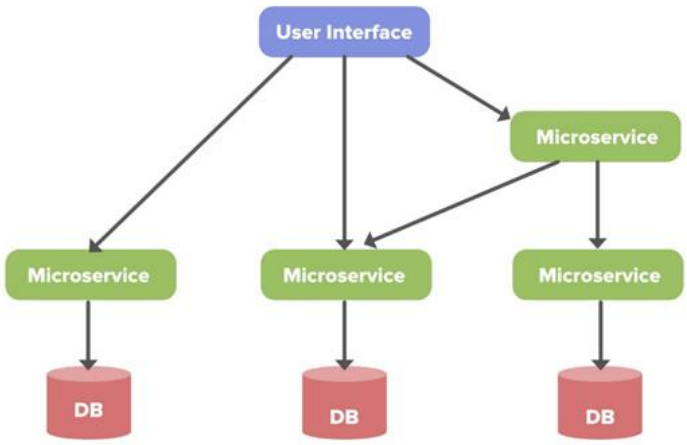

Figure 6. User Interface

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Netflix's architectural design consists of various services. All the APIs required for applications and Web applications are powered by this, which is referred to as microservices architecture. When a request reaches an endpoint, it contacts other microservices to get the required data. This microservice may also make requests to other microservices for that data. After that, the endpoint receives the entire response to the API request.

Services must be independent of each other in a microservices architecture. For example, video storage services should be separated from services responsible for video transcoding. Let's learn how to make it reliable now.

3.7 How Reliable is a Microservices Architecture?

Utilizing Hystrix (explained). Independent Critical Microservices: Some critical services (or endpoints or APIs) can be separated to be less dependent or independent from other services. Additionally, you can make some important services solely dependent on other trusted providers. You can choose to include all the basic functions, such as searching for videos, navigating to videos, clicking and playing videos, etc. Endpoints can be made highly available this way, and even in the worst case scenario, users will be able to perform basic tasks.

Treat the server as stateless: This may sound absurd to you, but to understand the idea, imagine your server as a herd of cows, and imagine you care about the amount of milk you receive each day. You just need to replace the cow (making less milk) with another cow if one day you realize that you are getting less milk from that cow. To get the required amount of milk, you are not required to depend on a particular cow.

The example above applies to our application. The goal is to create a service in such a way that you can move to another server and complete your work if one of the endpoints returns an error or does not respond to your request in a timely manner. You can send requests to other service instances and automatically spin up new nodes to replace them rather than relying on a specific server and maintaining state on that server. A new server will replace it if the old one stops working.

4. CONCLUSION

By considering the goals, vision and mission as well as governance principles, Enterprise Architecture is defined as a main plan that functions as a guide or guide for various aspects of business planning. On the other hand, business architecture also supports the company's technology and information aspects, such as system and database development. They also manage the technology the company uses, such as software and hardware.

Netflix needs EA design to help business architecture and improve company performance. This will also help the company to plan and manage system changes for the company. TOGAF is used in Netflix's Enterprise Architecture (EA) design with four stages, namely; Preliminary phase, Vision architecture, Business architecture and Information system architecture.

The main goal of a project in the initial stage, Preliminary phase, is to collect information and analyze current business needs. Then a Vision architecture is created to determine the long-term direction and vision of the project. Business architecture is developed based on this vision to plan the organizational structure, business processes and strategies that will be implemented. Apart from that, information system architecture is also intended to compile the information systems needed to achieve the company's goals and vision. what the company wants and also the architectural principles used as a design reference. These 4 phases can be said to aim to develop business architecture and information system architecture in accordance with the company's needs so that goals can be achieved and meet the organization's needs in advancing its goals.

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