Project Cloud Computing

1 Outline

Great job! You have landed a huge success! The customer is pleased by your ideas and wants to move forward with you as his new **cloud consultant, architect and engineer**! In the meantime the lead **enterprise architect** of the **Awesome Cloud AG** (your employer) has inspected the application landscape of the **LowTech GmbH** and has talked to other business experts on how to make the company more competitive. Therefore he has made some adjustments to the business plan and this has a consequence on the application landscape!

2 Proposed application landscape

In order to modernize the **LowTech GmbH** and improve their market standing in the future the company needs more applications! As a smart person ones said:
"Don't look for the needle in the haystack. Just buy the haystack!" — John Bogle

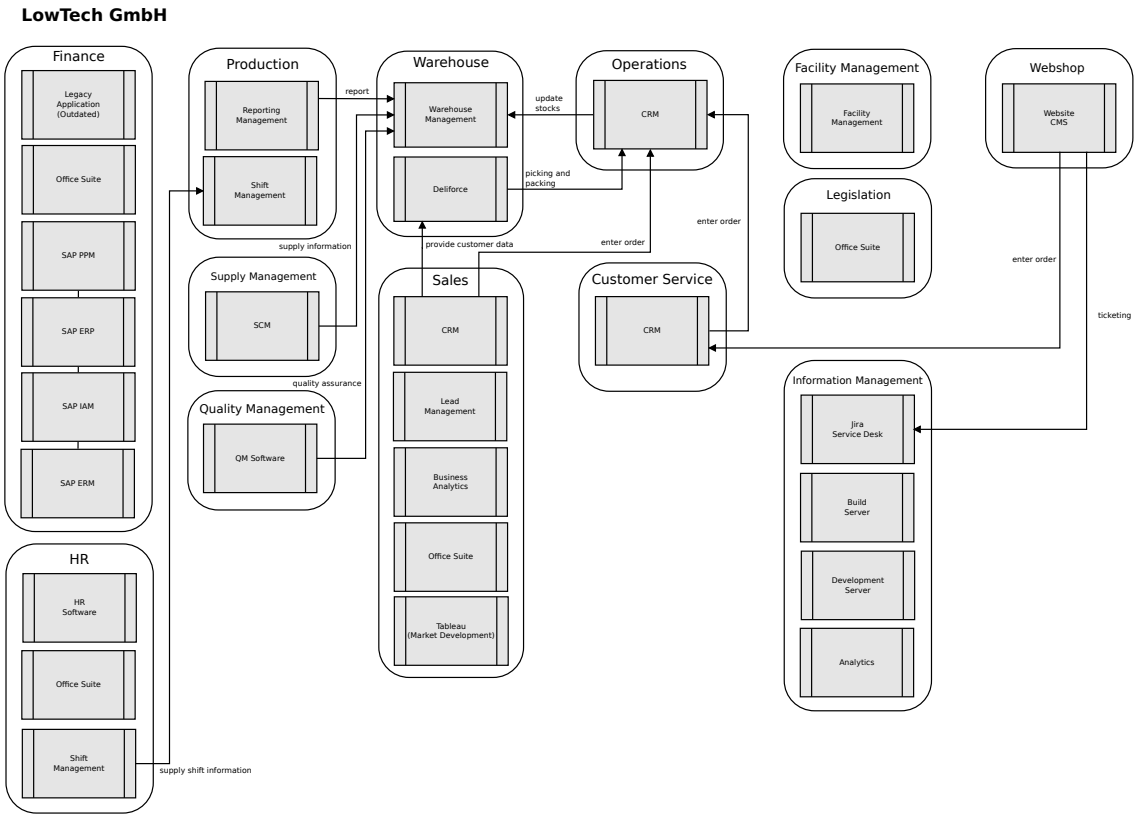

Figure 1: Application landscape of LowTech GmbH after review

So now you have to implement a cloud transformation strategy for the newly adjusted landscape depicted in figure 1.

Transformation of the case study

In short the following things have been adjusted by the business consultants and the enterprise architects:

- The **Finance department** insists on using **SAP Software**! **This is not negotiable!**
- The **Finance department** needs to use the **Legacy Application** for at least **three more years**!
- **HR** department gets a newly developed **custom HR Software** from our company!
- **Production** gets a newly developed **Shift Management** and **Reporting Management** system form our company!
- **Supply management** gets a **custom of the shelf (COTS) SCM (supply chain management)** software from a vendor!
- **Quality management** gets a **COTS QM software** for Windows systems from a vendor!
- **Warehouse** gets a newly custom **Warehouse Management** system from our company!
- **Warehouse** uses **Deliforce** either on premise or on-demand!
- **Sales** keeps the **Lead Management** system and gains additional **COTS** software!
- **Operations, Sales and Customer Service** share a common **COTS CRM** system!
- **Facility Management** gets a **proprietary software** on premise with **REST-API**!
- **Information Management** is a new department for the internal IT of the company!
- **Webshop** gets a newly developed **Website** from our company with new technology!

The points listed above are the main criteria for your cloud transformation approach! You need to take them into account, since this is the basis of the contract between the **Awesome Cloud AG** (your employer) and the **LowTech GmbH** (your customer)!

Assumptions for your project

In order to reduce complexity on the project consider the following assumptions:

- The **newly** developed applications from our company all run in **Python 3** with a **React** Frontend!
- The **newly** developed applications run everywhere (client, server, cloud)!
- **COTS** applications run everywhere (client, server, cloud)!
- **Legacy Application** (**Legacy Application, Lead Management**) only run on virtual machines with legacy operating systems!
- **Facility Management** can easily communicate with every system!
- **Information Management** has its own responsibility and does not need to be included in transformation!
- **Information Management** however is involved in the development of other systems and platforms!

Customer requirements:

- The architecture should be highly available, redundant and scalable!
- The architecture should be distributed!
- The architecture and applications should be flexible!
- Availability 99.99%!
- Max. downtime 15 minutes!
- Increased security of infrastructure.

3 Tasks

The aim of this project is to describe the requirements for the new operating infrastructure and the hosting environment. It serves as a basis for submitting proposals and offers for the concrete design of the setup and operation of the new infrastructure. This milestone also serves as the basis for the tasks required in **Milestone 3**!

The following tasks should be covered:

- Decide on a **migration strategy** [1] for each application and make a detailed **migration plan** for the cloud transformation!
- Make a plan for the cloud transformation in a **private** and **public** context!
- Make a plan for the cloud transformation in a **hybrid** context! (Identify applications that could/should be used in a private setup!)
- Include a solution for the service models **IaaS, PaaS (maybe FaaS)** and **SaaS** for the applications in the proposed landscape! Your final migration plan has to include at least one application for each service model!
  All service models must be included in your migration plan!
- Justify the use of the service models in your migration plan! What are the benefits of the use in your migration plan?
- Identify the potential to include the use of **DevOps** and **Cloud Native applications** for the application **Webshop**! Explain the benefits and drawbacks of your approach!
- Calculate the cost for the operation of the application landscape on a **public cloud service provider (CSP)**[1] platform!
- Prepare a diagram for the **migration roadmap**, **cloud architecture** and **DevOps/Cloud Native** application in your solution!

[1] Choose a service provider according to the formula in section 5!
Do not take licensing of software solutions into account!

4 Second Milestone (Date)

Artifacts for second Milestone:

1. Detailed **migration roadmap**, **cloud architecture** and **DevOps/Cloud Native** application with detailed description! Decide on an appropriate **migration strategy**[1] for each individual application!
2. Detailed description of **public, private** and **hybrid** setup of the landscape!
3. Detailed calculation of the cost for the operation of the application landscape on a **public cloud service provider (CSP)** platform!
4. Critical analysis of your solution with discussion of benefits and drawbacks!
5. Your assessment of the cloud transformation and your advice on the future direction of the project!

5 Choosing a CSP

Choose a public cloud service provider according to the following formula:

$$a \equiv b \mod 3 \tag{1}$$

With `b` being your **group number** and `a` as the result for your CSP:

- `a = 0` → **Amazon Web Services**
- `a = 1` → **Google Cloud Platform**
- `a = 2` → **Microsoft Azure**

Prepare a report and a presentation of 15 minutes length on the artifacts! The report and presentation are due to **21.06.2024**!

6 Literatur

References

[1] N. Ahmad, Q. N. Naveed and N. Hoda, *"Strategy and procedures for Migration to the Cloud Computing"*, 2018 IEEE 5th International Conference on Engineering Technologies and Applied Sciences (ICETAS), Bangkok, Thailand, 2018, pp. 1-5, doi: 10.1109/ICETAS.2018.8629101.