

# The Software–System Architecture of YEROTH–ERP–3.0

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This document describes the thick–client software–system architecture of YEROTH–ERP–3.0. This document also explains the reasons for which we chose to design and implement YEROTH–ERP–3.0 as a thick–client software–system, as opposed to currently more popular web–browser–based software–system.

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# Chapter 1

## Developer Biography



Figure 1.1: Portrait of Xavier.

**DR. XAVIER NOUMBISSI NOUNDOU** is a Cameroonian born on September 16 1983 in DOUALA (LITTORAL region, CAMEROON).

Xavier is a “Diplom–Informatiker (*Dipl.-Inf.*)” of the **University of Bremen, Bremen, Bremen, GERMANY** (May 25, 2007).

## Chapter 2

# Introduction

### 2.1 Motivation

YEROTH–ERP–3.0 is an **Enterprise Resource Planing (ERP)** software–system that aims ‘effectiveness’ and ‘simplicity’, compared to other high ranked ERP software–systems (e.g.: ‘Sage Gescom i7’, ‘SAP Business One’, etc.).

We chose to design and implement YEROTH–ERP–3.0 as a thick–client software–system because of the following reasons:

- 1) the implementation language C++ offers much flexibility (use of macro, multiple inheritance, etc.)
- 2) the availability of ‘WHAT YOU SEE IS WHAT YOU GET’ (WYSIWYG) tools for fast and useful user interface design (e.g.: Qt designer [Com20], miniStudio (vxWorks) [WEI20], etc.)
- 3) the low number of logical software architecture layer (2) involved with the operation of a thick–client software–system, as opposed to a web–browser–based software–system (with at least a 4 layers in its logical software architecture ).

### 2.2 Definitions

#### 2.2.1 Logical software–system architecture

#### 2.2.2 Physical software–system architecture

## Chapter 3

# Thick–Client VS Web–Browser–based Software–System Architecture

	Thick–client application ✓	Web–browser–based application
business code	all computers	application server
co–related software–systems	1 (DBMS)	at least 3 (DBMS, web / application server)
user interface	all computers (thick–client gui)	all computers (web–browser)
number of logical layers	2 (client and data)	4 (client, presentation, logic, and data)
rapid prototyping (WYSIWYG tools)	yes	very limited
software security vulnerability	low (1 programming language)	high (several programming languages)

Table 3.1: Thick–client application VS Web–browser–based application.

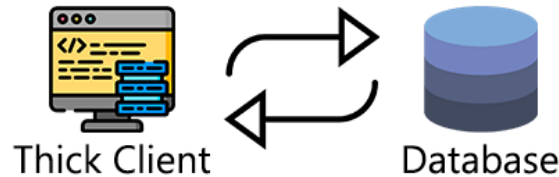


Figure 3.1: 2–layers logical architecture of thick–client software–system (Image copied from [sec20]).

Figure 3.1 illustrates an example of a thick–client software–system with a 2–layers logical architecture.

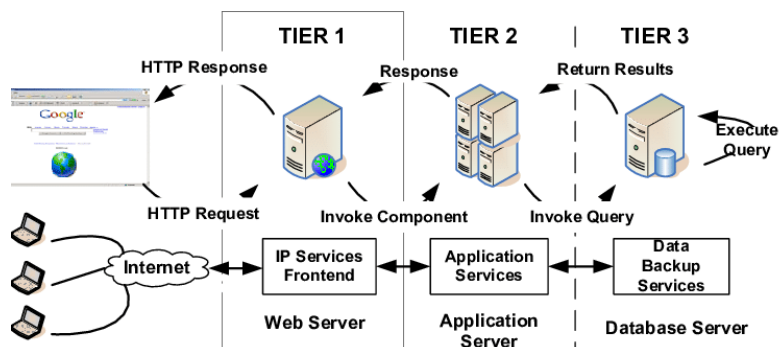


Figure 3.2: 4–layers logical architecture of web–browser–based software–system (Image copied from [KM06]).

Figure 3.2 illustrates an example of a web–browser–based software–system with a 3–layers logical architecture.

Table 3.1 compares thick–client software–systems against web–browser–based software–systems.

## Chapter 4

# The Thick–Client Software–System Architecture of YEROTH–ERP–3.0

### 4.1 Business and user interface code deployment

Table 3.1 depicts the issue of business and user interface code deployment on all computers participating in the functioning of YEROTH–ERP–3.0, as a software–system for a user.

We tackle the problem of automatic deployment of business and user interface code on all user computers by using the ‘apt upgrade’ software–system on ‘Debian–Linux’.

### 4.2 Co–related software–systems

### 4.3 User interface

### 4.4 Number of logical layers

### 4.5 Software security vulnerabilities

#### 4.5.1 Vulnerability detection

#### 4.5.2 Vulnerability prevention

#### 4.5.3 Vulnerability protection



## Chapter 5

# Related Software–System Architectures

**5.1 Fat–client software–system architecture**

**5.2 Thin–client software–system architecture**

## Chapter 6

# Conclusion

YEROTH–ERP–3.0 has a thick–client software–system architecture because we found thick–client software–system architectures simpler than web–browser–based software–system architectures.

Thick–client software–system architecture because it requires less layers in its logical software–system architecture.

Table 3.1 illustrates a thick–client software–system requires less layers in its logical software–system architecture than a web–browser–based software–system.

a web–browser–based software–system potentially entails more present software security vulnerabilities because its implementation requires to use at least 2 different programming languages, and frameworks in combination.

A web–browser–based software–system architecture has more drawbacks as follows:

- 1) it requires at least 3 other software applications to fully operate (e.g.: DBMS, web server, application server.).
- 2) A web–browser–based software–system requires at least 4 layers in its logical system architecture (e.g.: client, presentation, logic, and data layers).
- 3) A web–browser–based software–system potentially possesses more software security vulnerabilities because its implementation requires to use at least 2 different programming languages, and frameworks in combination.

## Chapter 7

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