PEDRO GOMES BRANQUINHO

Free software in industry and academia

Lorena

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This monograph is presented to the Engineer School of Lorena, the University of São Paulo, so to be obtained the title of Barchelor by the Graduation Program on Engineering Physics with emphasis on the Science of Materials.

University of São Paulo - USP
Engineer School of Lorena

Monograph, Conclusion Thesis

Supervisor: Dr. Wei-Liang Qian

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To those whom found me in their own path
and, by finding me, made part of my own.

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Abstract

In this work, It's shown how to build a series of application only upon a Free Software system - EXWM, Artix Linux OSS. I explain how the experience of participating in the Open Community can be significant for other Engineers; specially Physics Engineers. It's delineated what are the current trends on the adoption of Free and/or Open Source Software (FOSS). Furthermore, I put forward some of the tools I used in Academia, and in Industry, and some other not so well known software, which could be used in these two contexts - e.g., Freqtrade, OR-Tools, Git(hub) et cetera. I also argue why Linux is such a key software for someone shifting to the Open Source paradigm.

Key-words: trends. foss. academia. industry. linux. freqtrade. or-tools. git. github.

Resumo

Demonstrou-se como é possível construir uma série de aplicações baseada em softwares de licença livre, à partir de um sistema aberto, o Linux com inteface EXWM - Emacs X Window Manager. Além disso, foi propiciado casos reais de aplicações na Indústria e no investimento privado, autônomo. Bem como, utilizações na Academia, à nível de lecionar, e pequisa. Sustenta-se que a economia aberta possui similaridade estrutural ao movimento *Open Source* e seu desenvolvimento, o que aponta que essa é e continuará a ser, paulatinamente mais, o paradigma de desenvolvimento econômico tecnológico. Assim, imprescindível à formação do engenheiro.

Palavras-chaves: software livre. automação. freqtrade. idústria. academia.

Lista de ilustrações

List of abbreviations and acronyms

FOSS	Free and Open Source Software
abnTeX	ABsurdas Normas para TeX

Sumário

1 Introduction

In training a Physics Engineer, of which, by definition, is a generalist professional. The use of Free and Open Sourced Softwares (FOSS), as well as the participation in the Open Source community (OS), are two detrimental experiences to have.

The variability, which open source software (OSS) brings to existence of applications and it's extension, can change altogether user's experience. Thus, taking him closer to acting as a developer. This experience of interloping user and developer roles doesn't require that you are a computer scientist or a Information Technology (IT) professional by training. For, programming can be seen as both a Science and an Art (KNUTH, 1968) - e.g., an exercise of self-expression.

OSS guarantees four fundamental liberties seção 2.1, the right to study, copy, modify and redistribute it.

Just as the scientific enterprise benefits, with it's rapid development, by means of the global community's participation, which holds space for individuals with a variety of different training. Also, the computation enterprise benefits from the variety of people's training, which constitute the body of the open source community.

2 Bibliography review

2.1 Open Source

Any program which permits the user-developer to have the following liberties:

1. The right to run the program, as seen fit, for any end.
2. The right to access the source code and study it.
3. The right to copy and redistribute it.
4. The right to modify the software.

Practically, the Open Source community fundamentally base itself upon the free distribution of it's tools and programs. One of the differential advantage of having innumerable other people extending the same software is that the advancement of the frontier of the program, in many directions, increases rapidly in relation to a program controlled by a limited number of programmers.

2.1.1 Diversity

Given that one fundamental right of OSS is the modification and propagation of new modified versions. This right implies in the observable wide range of maintained versions of these software, which doesn't have a parallel in any other technological enterprise.

For an example, one key application in any user's computer is a general Graphical User Interface (GUI)'s manager, commonly known as Window Manager (WM). These can be both Floating or Tilling, or mixed WM, e.g., Floating WM are those that the user must hover windows and adjust them manually; Tilling WM are those that a pre-defined program have a set of rules to resize automatically the windows in a screen.

While private Operational Systems (OS), as Windows and MacOS, have frequent releases - a total of twenty five releases for Windows. Generally, they've few *active* versions; Windows have currently four (MICROSOFT..., 2021). MacOS also have four active versions (MACOS..., 2021).

The fact there are only narrowly supported versions is due to, among many contributing factors, users lack the right to alter and extend the software's behavior. Therefore, they fall victims of discontinued support and restrictive access to the company's official upgrades.

On the other hand, there exists, in parallel, around two hundred seventy eight available distributions of Linux (LINUX..., 2021). Of which, there are main/root distributions, which each embody a set of different principles; theoretical and practical philosophies of

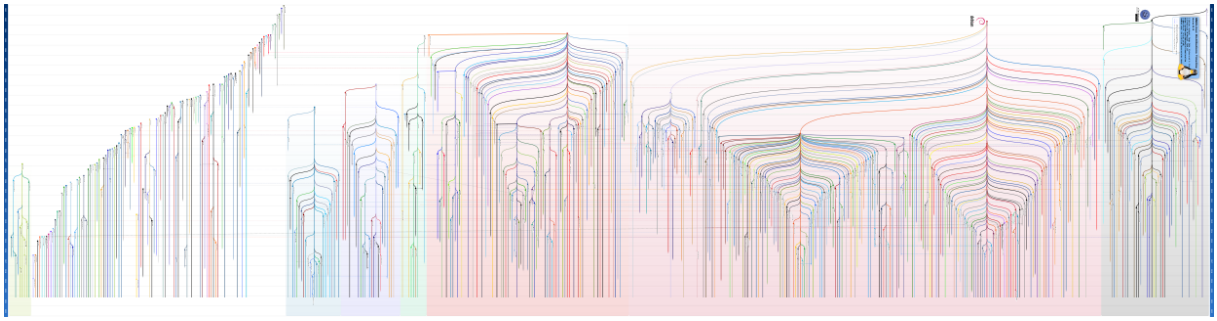
how to extend software.

Thus, just as with any other scope of software, the variability of FOSS always will be grater than monopolized ones.

2.2 GNU/Linux

There are root distributions of Linux, from which many other distributions emanate. Generically, these partitions are called families. We cite some of the most influential and popular ones, Red Hat Linux (), Debian (), CentOS (), Fedora(), Pacman-based (/), OpenSUSE (), Gentoo-based (), Ubuntu-based(), Slackware (), Open Sourced-based and the Independent Distributions (/).

Figura 1 – Genealogy of Linux's Distributions



Genealogical history of Linux Distributions (LINUX..., 2021)

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