



FRESCHE SOLUTIONS

Business uses for Python & IBM i

Mike Pavlak – IT Strategist

NHMUG

New Hampshire
Midrange User Group

Corporate Overview



40+ years in business

- ▶ Management and employee owned
- ▶ 300+ employees
- ▶ 18 yr average employee tenure
- ▶ Named one of Canada's top small and medium employers



22,000+ customers

- ▶ 8 offices around the world
- ▶ North America, Europe, Latin America and Asia Pacific
- ▶ Over 200 partners/resellers



Application Management and Modernization Experts

- ▶ 15+ years application optimization, integration, modernization expertise
- ▶ 40 years of IBM i product development



Innovative Products and Services

- ▶ Web, mobile and GUI modernization
- ▶ Analysis & productivity
- ▶ Application & database modernization

FRESCHESOLUTIONS

BCD looksoftware

QUADRANT
SOFTWARE

A little background, please

What is Python, really?

- General purpose language
- Easy to get started
- Simple syntax
- Great for integrations (glue between systems)
- Access to C and other APIs
- Infrastructure first, but applications, too



Historically...

- Python was conceptualized by **Guido Van Rossum** in the late 1980's
- Rossum published the first version of Python code (0.9.0) in February of 1991 at the CWI(Centrum Wiskunde & Informatica) in the Netherlands, Amsterdam
- Python is derived from the ABC programming language, which is a general purpose language that was also developed at CWI.
- Rossum chose the name “Python” since he was a fan of Monty Python's Flying Circus.
- Python is now maintained by a core development team at the institute, although Rossum still holds a vital role in directing its progress and as leading “commitor”.



The Python programming language <https://www.python.org/>

99,953 commits 9 branches 331 releases 356 contributors

Branch: master New pull request Find file Clone

haypo committed on GitHub bpo-31234: Enhance test_thread.test_forkinthread() (#3516) Latest commit a15d155 5 hours ago

File	Commit Message	Time
.github	Create PULL_REQUEST_TEMPLATE.md (GH-3404)	6 days ago
Doc	bpo-31421: Document how IDLE runs tkinter programs. (#3513)	10 hours ago

Python lineage

- Python 1 – 1994
- Python 2 – 2000 (Not dead yet...)
 - ▶ 2,7 – 2010
- Python 3 – 2008
 - ▶ 3.5 – 2015
 - ▶ 3.6.2 – July 2017
 - ▶ 3.7 ➔ ETA July 2018

Release version	Release date
Python 3.4.7	2017-08-09
Python 3.5.4	2017-08-08
Python 3.6.2	2017-07-17
Python 3.6.1	2017-03-21
Python 3.4.6	2017-01-17
Python 3.5.3	2017-01-17
Python 3.6.0	2016-12-23

Why use it?

Academia

- 1980's
 - ▶ COBOL, Basic
- 1990's
 - ▶ Paschal, Delphi
- 2000
 - ▶ Java
- 2010
 - ▶ Python



Carnegie Mellon

- School discovered that students understood OO
 - ▶ But could not build a logic loop to save their soul!
- Robert Harper, professor of CS writes:

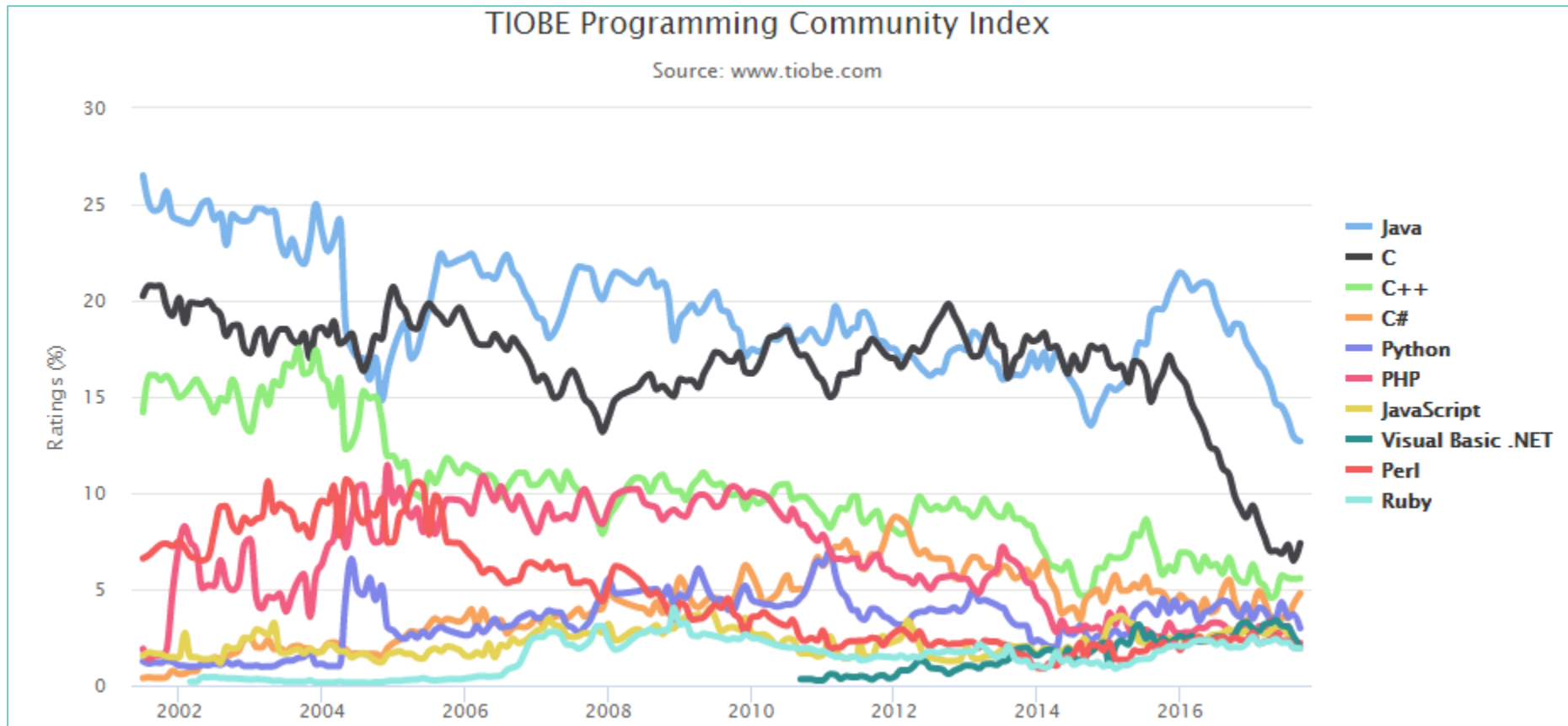
"Object-oriented programming is eliminated entirely from the introductory curriculum, because it is both anti-modular and anti-parallel by its very nature, and hence unsuitable for a modern CS curriculum. A proposed new course on object-oriented design methodology will be offered at the sophomore level for those students who wish to study this topic."



Tiobe Index September 2017

TIOBE Index TIOBE - The Software Quality Company						
www.tiobe.com/tiobe-index/						
Sep 2017	Sep 2016	Change	Programming Language	Ratings	Change	
1	1		Java	12.687%	-5.55%	
2	2		C	7.382%	-3.57%	
3	3		C++	5.565%	-1.09%	
4	4		C#	4.779%	-0.71%	
5	5		Python	2.983%	-1.32%	
6	7	▲	PHP	2.210%	-0.64%	
7	6	▼	JavaScript	2.017%	-0.91%	
8	9	▲	Visual Basic .NET	1.982%	-0.36%	
9	10	▲	Perl	1.952%	-0.38%	
10	12	▲	Ruby	1.933%	-0.03%	
11	18	▲	R	1.816%	+0.13%	
12	11	▼	Delphi/Object Pascal	1.782%	-0.39%	
13	13		Swift	1.765%	-0.17%	
14	17	▲	Visual Basic	1.751%	-0.01%	
15	8	▼	Assembly language	1.639%	-0.78%	
16	15	▼	MATLAB	1.630%	-0.20%	

Tiobe top 10 trending, September 2017



COBOL = 26

RPG = over 50

Some reasons folks like Python

- Open source is free, right?
 - ▶ Yes, no...well – sort of...
 - ▶ No charge LP on IBM i – 5733OPS
- Only scripting language to support multiple inheritance
- Multi-threading
 - ▶ Stateful, not Async like Node
 - ▶ But same motivation as Node, non-blocking
- Applications develop faster
 - ▶ Extensive standard library that is constantly evolving
 - ▶ Frameworks such as Bottle

```
from multiprocessing.dummy import Pool as ThreadPool  
pool = ThreadPool(4)  
results = pool.map(my_function, my_array)
```

One more reason folks like Python



Industries using Python

- Technology
 - ▶ Geospatial, Machine Learning
 - ▶ Honeywell - Build automation
- Manufacturing
 - ▶ D-Link updates – Multithreaded
 - ▶ Phillips – Robot programming and sequencing
- Entertainment
 - ▶ ILM – Scripting CGI Intensive films
 - ▶ Video gaming
- Transportation
 - ▶ Airports – Frequentis for weather info
 - US, Denmark, Iceland, Hong Kong, etc.

Companies using Python

- YouTube - Backend
- Facebook – (see next slide)
- Dropbox
- NASA – Weather and more
- IBM
- Mozilla
- Instagram
- Red
- Quora

▶ Why python?



Adam D'Angelo, wrote a lot of Python for Quora

Updated Sep 12, 2014 · Upvoted by Charlie Cheever, [One of the founders of Quora](#) and Scott Danzig, avid Quora user since 2012, and a Quora Top Writer

Python was a language that Charlie and I both knew reasonably well (though I know it a lot better now than I did when we started). We also briefly considered C#, Java, and Scala. The biggest issues with Python are speed and the lack of typechecking.

Facebook in detail

■ Top three languages

- ▶ Hack (fork of PHP)
- ▶ C++
- ▶ Python

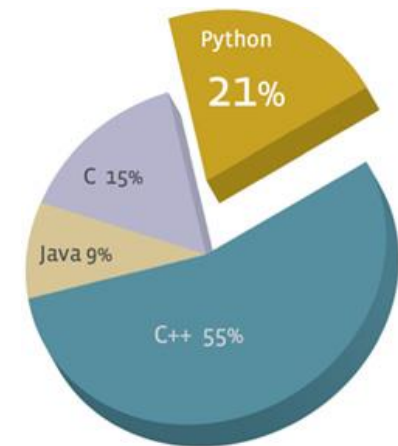
- Millions of lines of code, thousands of libraries and binaries
- 2016 to date: average 5,000 commits per month, 1,000+ committers
- 5 percent Py3 (as of May 2016)

■ Infrastructure management

- ▶ Network switch setup
- ▶ Core services (DNS, etc,)
- ▶ Server imaging, burnin-in.

■ Platform services: Job Engine, team workflow management

<https://code.facebook.com/posts/1040181199381023/python-in-production-engineering/>



Notes

- Why is Python so odd for IBM i?
 - ▶ No apparent clear use case
 - ▶ Not a lot of IBM i Python developers...yet.

- We'll get to this...

The right hammer, please

- Java – Device programming
- PHP – web programming
- COBOL & RPG – business programming and batch language
- Python – General purpose
 - ▶ Dang, no “specific” purpose or...
 - ▶ A place EVERYWHERE!
 - ▶ Possibly the NEW batch solution...

Platform for Modernization

Web2py

- Open source application framework project
- Dedicated to backward compatability
 - ▶ But what happens when the language changes?
 - ▶ Python2 → Python3
 - BC Breaks!
- Massimo DiPierro –
 - ▶ CDM Director of the master of Science in Computational Finance at DePaul University.
 - ▶ Lead developer of project

Web2py - Features

- Database abstraction
- Hello World in seconds
- No lengthy learning curve
- Designed by business people for business people



Massimo: *I believe that the ability to easily build high quality web applications is of critical importance for the growth of a free and open society.*

Documentation

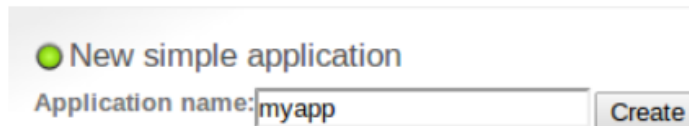
■ Clear and easy to read

Simple examples

Say hello

Here, as an example, we create a simple web app that displays the message "Hello from MyApp" to the user. We will call this application "myapp". We will also add a counter that counts how many times the same user visits the page.

You can create a new application simply by typing its name in the form on the top right of the **site** page in **admin**.







A screenshot of a web form titled "New simple application". It features a green circular icon with a white plus sign. Below the title is a text input field labeled "Application name:" containing the text "myapp". To the right of the input field is a "Create" button.

After you press [create], the application is created as a copy of the built-in welcome application.



Web2py


[web2py / web2py](#)


 Watch
 237
 Star
 1,471
 Fork
 709

<> Code
🔔 Issues 146
🔗 Pull requests 3
📁 Projects 0
📖 Wiki
Insights ▾

Free and open source full-stack enterprise framework for agile development of secure database-driven web-based applications, written and programmable in Python. <http://www.web2py.com>

📄 7,354 commits
🌿 5 branches
📦 66 releases
👥 136 contributors

Branch: master ▾
New pull request
Find file
Clone or download ▾


mdipierro committed on [GitHub](#) Merge pull request [#1766](#) from abastardi/tsv_export ...
 Latest commit 5975e47 5 days ago

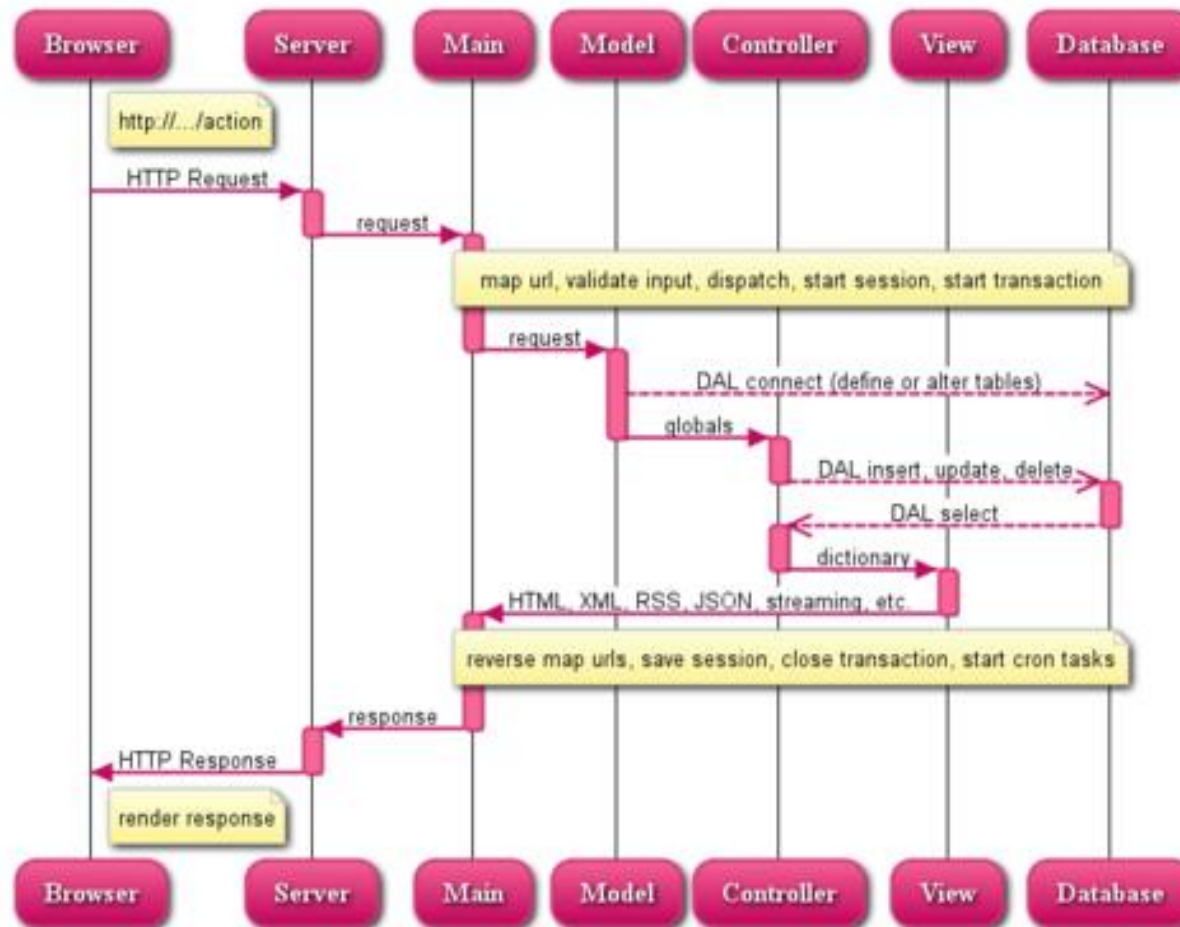
📁 applications	Fix submit button disable bug	a month ago
📁 docs	adjusted docs to newer structure	3 years ago
📁 examples	better support for -f	2 years ago
📁 extras	R-2.9.12	3 years ago
📁 gluon	Merge pull request #1766 from abastardi/tsv_export	5 days ago

Web2py & PHP 3

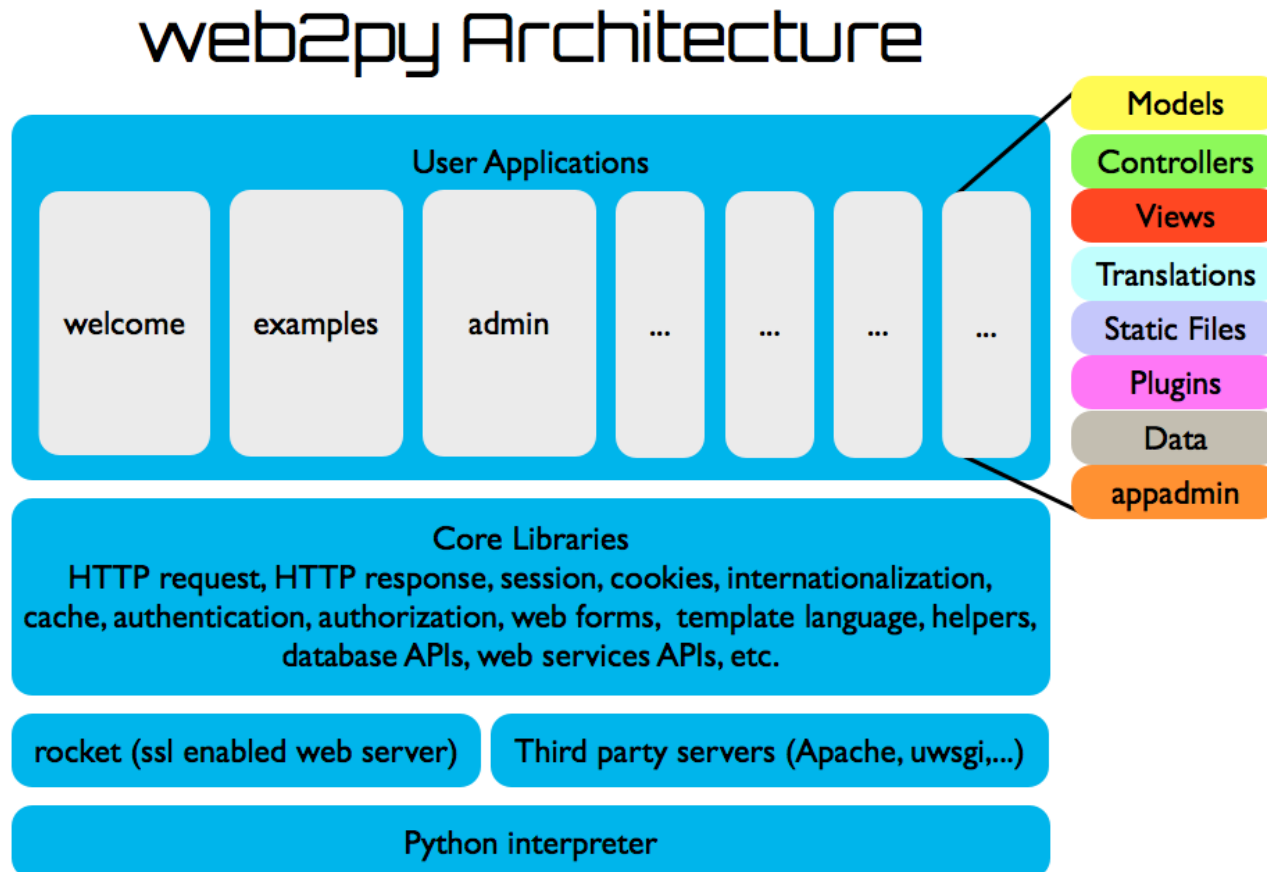
- Currently under development
- Function reformatting
- New database engine

Logic flow

- Sacrifice religion for easy to use



Web2py - Architecture



PHP example of data access

```
1      <html><body><h1>Records</h1><?
2      mysql_connect(localhost,username,password);
3      @mysql_select_db(database) or die( "Unable to select database");
4      $query="SELECT * FROM contacts";
5      $result=mysql_query($query);
6      mysql_close();
7      $i=0;
8      while ($i < mysql_numrows($result)) {
9          $name=mysql_result($result,$i,"name");
10         $phone=mysql_result($result,$i,"phone");
11         echo "<b>$name</b><br>Phone:$phone<br /><br /><hr /><br />";
12         $i++;
13     }
14     ?></body></html>
```

Same thing in Python with web2py

```
1     def index():  
2         return HTML(BODY(H1('Records'), db().select(db.contacts.ALL)))
```

A New ERP?

odoo

- Open Source ERP application
- Includes
 - ▶ CRM
 - ▶ Point of Sale
 - ▶ Helpdesk
 - ▶ Manufacturing
 - ▶ Accounting
 - ▶ Event management
 - ▶ HRIS
 - ▶ More...




odoo Mission




To be very easy to use and fully integrated





■ Timeline

- ▶ 2005 – Initial release (TinyERP)
- ▶ 2008 - OpenERP
- ▶ 2013 – odoo Community Association established
- ▶ 2014 Company renamed to odoo

Stats for ODOO?





 **odoo / odoo**

 Watch 1,233  Star 7,574  Fork 6,841


 Code  Issues 2,665  Pull requests 1,300  Wiki Insights ▾






Odoo. Open Source Apps To Grow Your Business. <https://www.odoo.com>

[odoo](#) [python](#) [business](#) [management](#) [odoo-apps](#) [erp](#) [apps](#)

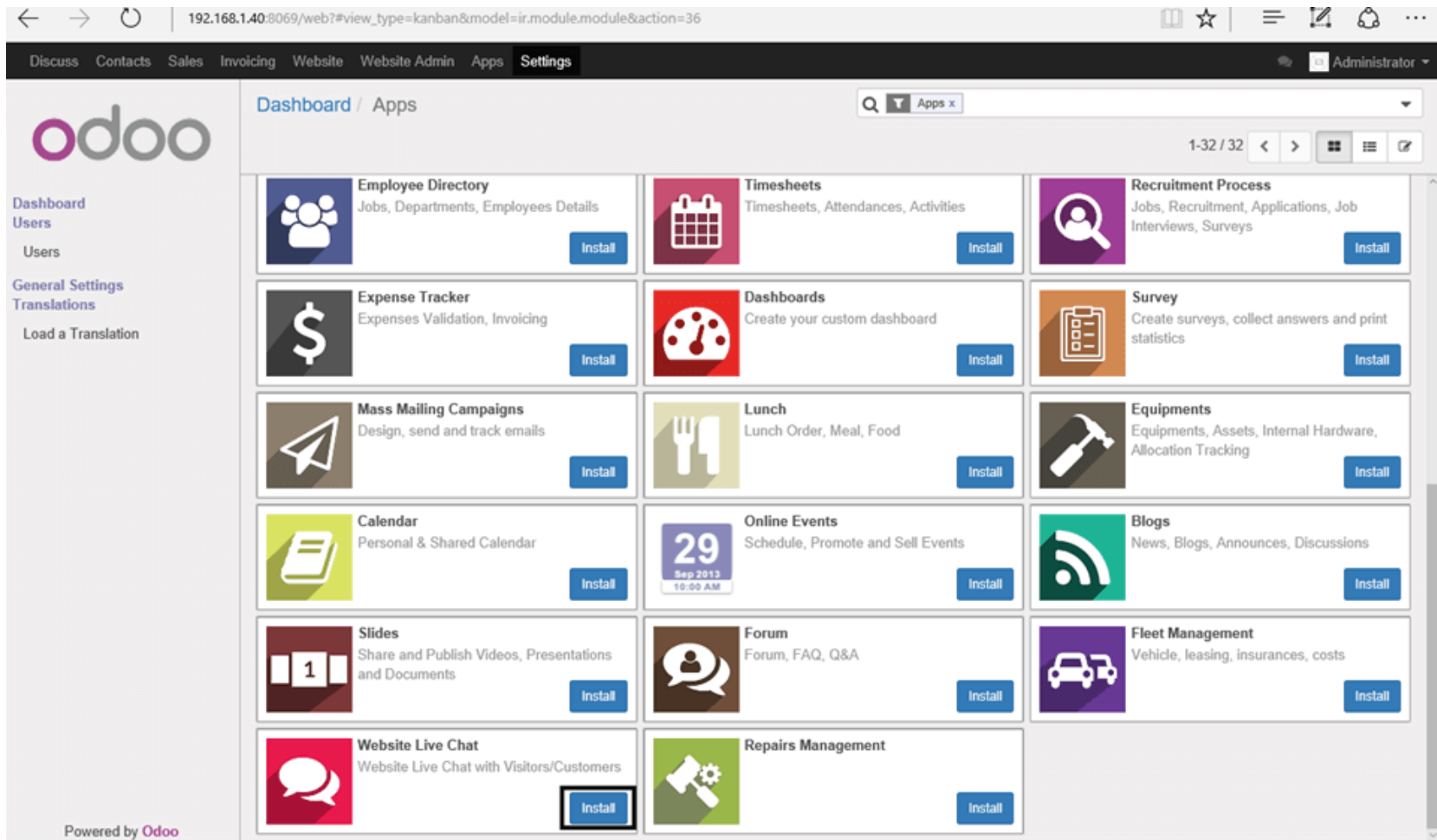
 108,749 commits  26 branches  78 releases  633 contributors

Branch: 10.0 ▾ [New pull request](#) [Find file](#) [Clone or download ▾](#)

 C3POdoo [I18N] Update translation terms from Transifex Latest commit 682b2c0 21 hours ago

 .github	[ADD] Github template files for issues and PR	2 years ago
 .tx	[I18N] update source terms	3 months ago
 addons	[I18N] Update translation terms from Transifex	21 hours ago
 debian	[MERGE] forward port branch saas-12 up to 6f8e40c	11 months ago
 doc	[MERGE] forward port branch 9.0 up to 1970761	5 days ago

Does this look like your typical – IBM i ERP?



Who is using odoo?

■ Toyota

Country: France

Industry: Automotive/Material Handling

Apps Implemented: CRM, Sales, Purchase, Manufacturing, Inventory, Accounting

Implementing Partner: Smile

Number of Users: 10 Users

■ Aggressive competition

- ▶ Could not afford long ramp up/risk

■ Up and running in 6 months



Who is using odoo?

■ FYG

- ▶ Selling, delivering, installing, and maintaining components and systems, focused on industrial and commercial markets

Company: Frew Process Group/A.B. Young/Gasco or FGY Team

Country: Indiana, USA

Industry: Industrial Equipment Supplier

Apps Implemented: CRM, Sales, Accounting, Purchase, Inventory

Implementing Partner: Ursa Information Systems

■ SAP Proves too Rigid for FGY



Why did so many companies come to IBM i?

- Why did so many companies come to IBM i?
- 1980's
 - ▶ Affordable over mainframe
- 1990's
 - ▶ Established ERP's and Y2K
- 21st Century
 - ▶ ???



Who is using odoo?

■ Florida Iron Doors

- ▶ Selling, delivering, installing, and maintaining components and systems, focused on industrial and commercial markets

Location: Deerfield Beach, Florida, United States of America

Industry: Manufacturer of Iron Doors

Apps Implemented: CRM, Sales, Inventory, Accounting, Invoicing, Studio

Number of Users: 10 Users

Implementation Time: 8 Weeks in Production + 50 Hours with a Consultant

■ SAP Proves too Rigid for FGY



This can't be free...

FREE PLAN	ONLINE	ENTERPRISE
Free for One App	from USD 25.0 /user/month	USD 30.0 /user/month
< 50 users self-service	< 50 users service by Odoo	> 50 users service by partner
START NOW	VIEW PRICING	BUY NOW
1 App	Pay as you grow	All Apps
Free	Monthly	Annually
✓	✓	×

odoo Community

■ Partners

- ▶ All over the US
- ▶ Little to no IBM i experience

United Kingdom	10
United States	50
Uruguay	6



What about PHP?

- PHP is a great solution
- Designed for web pages and content management
- odoo was conceived to be a business application

The screenshot shows the GitHub repository for inoERP. At the top, the repository name 'inoerp / inoERP' is displayed. To the right, there are buttons for 'Watch' (88), 'Star' (301), and 'Fork' (378). Below this, there are tabs for 'Code', 'Issues' (27), 'Pull requests' (3), 'Projects' (0), and 'Insights'. The main description states: 'inoERP is a PHP-based open source enterprise management system that can be used with several databases - such as Oracle 12c, MariaDB, MySQL. The ERP system contains all the functionalities required for running any manufacturing, service or distribution organization. The features are very similar to Oracle R12/ Fusion Application and SAP. It also... <http://inoideas.org>'. Below the description, there is a progress bar showing statistics: 965 commits, 8 branches, 13 releases, 2 contributors, and MPL-2.0 license. At the bottom, there is a table of recent commits.

Commit	Message	Time
inoerp 0.6.1		Latest commit f24d02d 25 days ago
inoerp	0.6.1	25 days ago
COPYRIGHT.txt	Update COPYRIGHT.txt	9 months ago
LICENSE.txt	Update LICENSE.txt	9 months ago

Where do I go for help?

Python is popular with startups!

- Open source creates tremendous opportunities

The screenshot shows the Clutch website interface. At the top left is the Clutch logo with the tagline 'Firms that deliver'. To the right is a search bar and a dropdown menu labeled 'More in Web & Software Development'. The main heading is 'Top Python & Django Developers'. Below this heading, there is a tab labeled '2017 Reviews' which is highlighted with a red rectangular box. To the left of this tab is a button that says '218 Firms'. Below the tabs, there are several filters: 'Reviews' (with a red underline and a smiley face icon), 'Leaders Matrix' (with a bar chart icon), 'Sort by' (with a dropdown arrow), 'Sponsored' (with a dropdown arrow), and 'Filter' (with a dropdown arrow).

GADgroup.

- Consulting firm based in Chicago area
- 10-20 local consultants

GAD Group Technology, Inc. was established to meet the demand for cutting edge technology and sophisticated software applications by small and medium sized businesses, government municipalities and non-for-profit organizations with limited budgets for full time "IT Resource."



GAD GROUP TECHNOLOGY INC.

"Integrating people, processes and technology,
the RIGHT way!"

Gregory Dover – GAD Group

- Specializes in SMB companies
- Uses Python to modernize legacy
 - ▶ IBM i
 - ▶ SQL Server
 - ▶ VB
 - ▶ HP UX
- Build custom
- ODOO business practice.
- WEB2PY for integration

Summary

- Python may be better positioned for business than any other open source language
- It is mature, just not on IBM i.
- Database expectations mostly agnostic, getting better.
- Start slow and grow into it!

End-to-End Application Modernization Solutions

**GUI, Web &
Mobile**



**Analysis &
Productivity**



**Reporting &
Document Distribution**



**Code & Database
Modernization**



**IT Strategy
Services**



**Application
Services & Staffing**



THANK YOU

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