

# COMPARING JVM WEB FRAMEWORKS

Matt Raible

<http://raibledesigns.com>

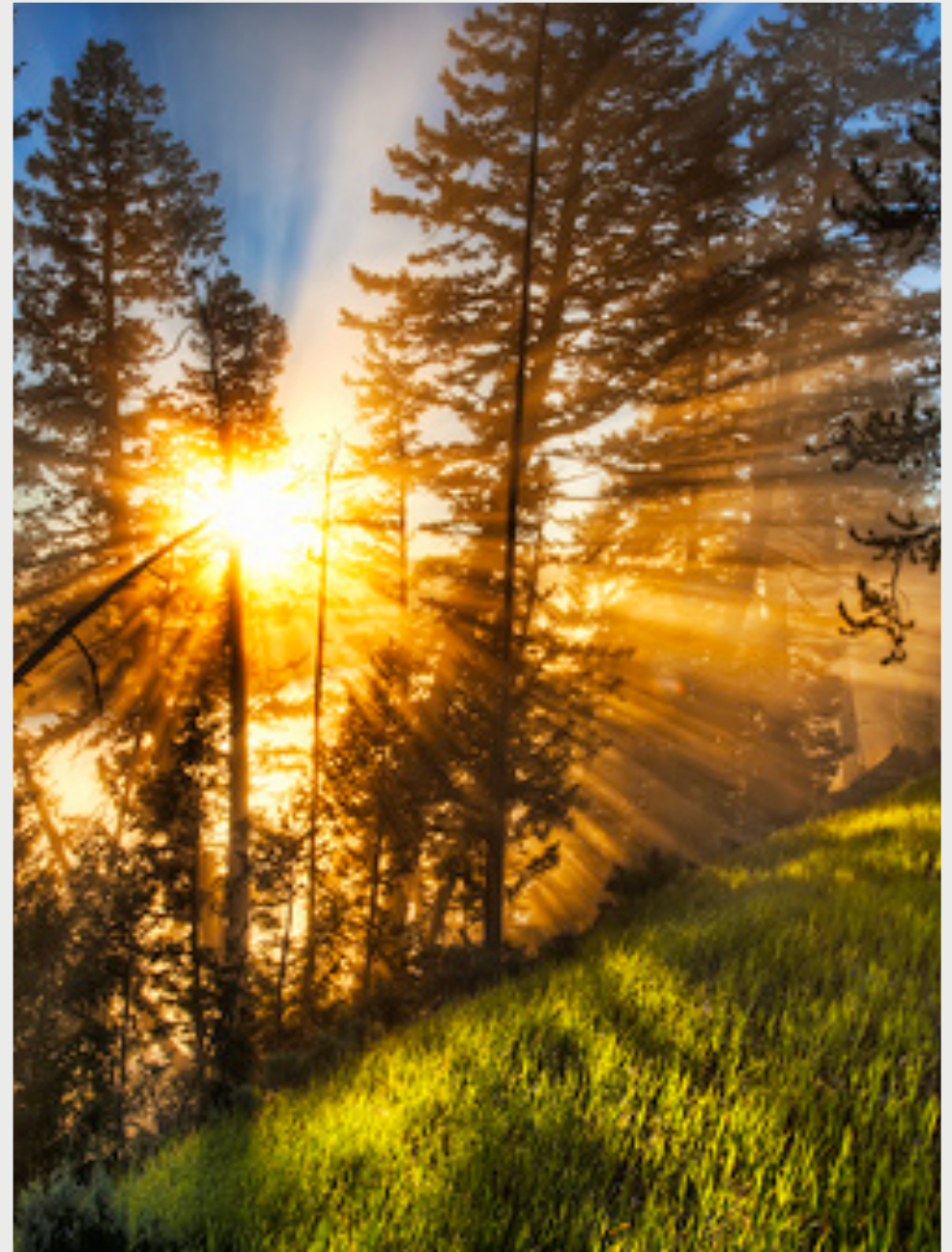
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# INTRODUCTIONS

- Your experience with web development?
- Your experience with Java EE development?
- What do you want to get from this session?
- Experience with Grails, GWT, Rails, Spring MVC, Wicket, Tapestry or Play?





Blogger on [raibledesigns.com](http://raibledesigns.com)

Father, Skier,  
Cyclist

Founder of [AppFuse](#)

Web Framework Connoisseur

Who is **Matt Raible**?





# SESSION AGENDA

- The Problem with Web Frameworks
- The Candidates
- Comparison Points
- The Matrix
- Conclusion
- Q and A





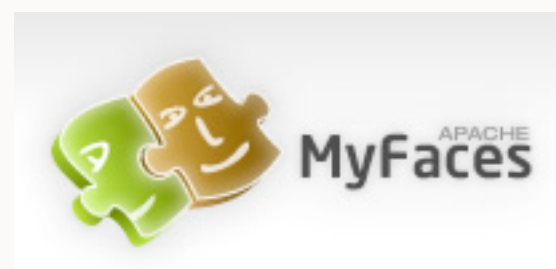
# THE PROBLEM



apache  
**tapestry 5**  
*Code less, deliver more.*



**Struts<sup>2</sup>**





# HOW DO YOU CHOOSE?





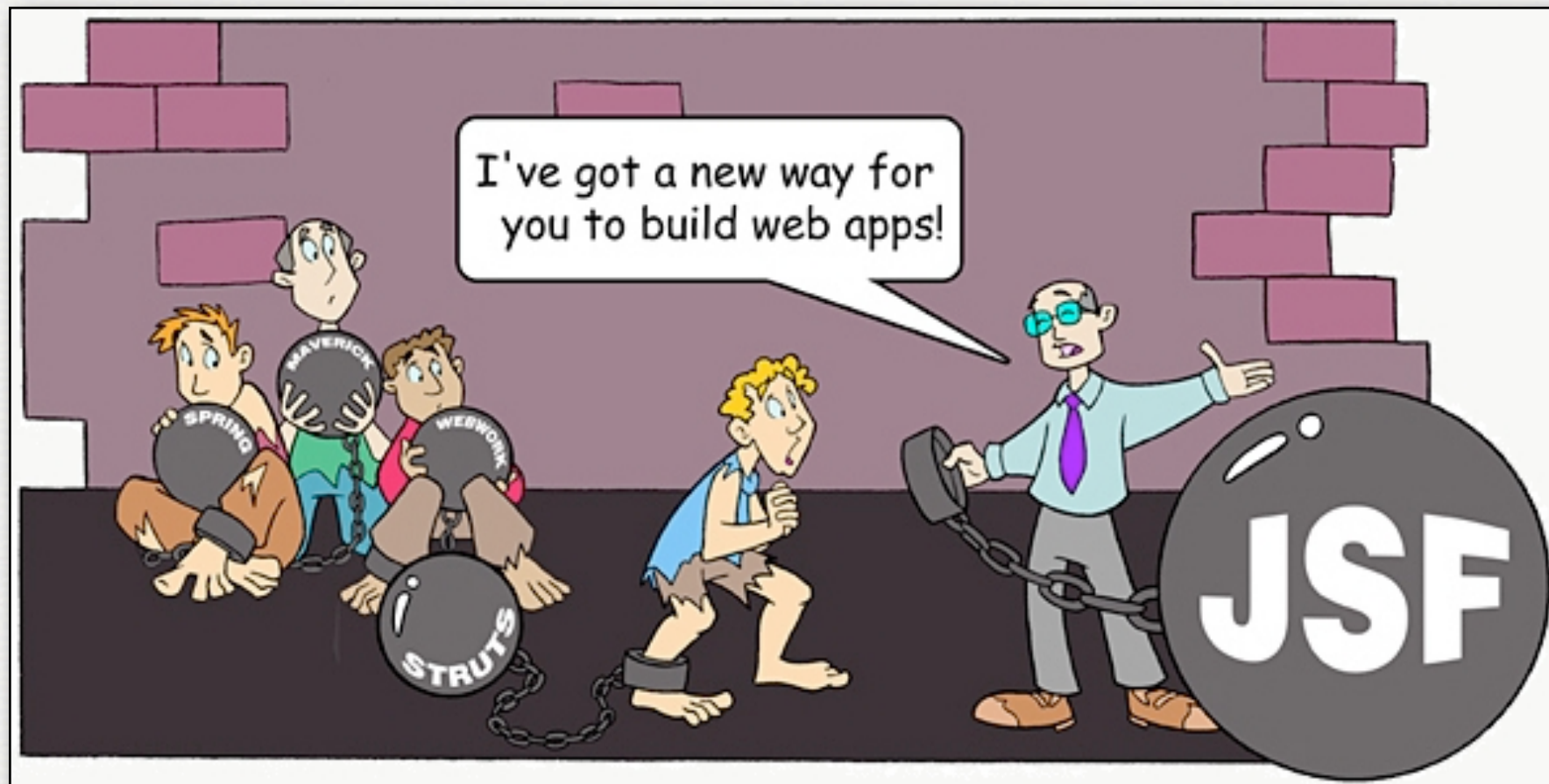


ELIMINATE, DON'T INCLUDE











... while I'd \*love\* to see life made simpler for Java web developers, and a lot of the things happening in Struts2 are going that way -- it won't be me doing it.

I've gone over to the dark side :-)) and much prefer to develop in Rails -- for the conciseness mentioned above, but also because I don't ever have to do a "build" or "deploy" step during my development cycle any more. But you guys and gals need to be reminded that \*this\* is the kind of thing you are competing against if you expect to attract Rails developers ... or to avoid even more "previously Java web developer" defectors like me :-)).

*-- Craig McClanahan, 10/23/2007*

<http://markmail.org/thread/qfb5sekad33eobh2>



# JAMES GOSLING ON JSF

**James Gosling on Apple, Apache, Google, Oracle and the Future of Java**

UserGroupsatGoogle

62 videos

Subscribe



<http://www.youtube.com/watch?v=9ei-rbULWoA#t=47m>



# 2007: 6 IMPORTANT FACTORS

- Request, Component or RIA Framework
- Ease of Development
- Project Community
- Project Future and Roadmap
- Maintenance
- Technical Features





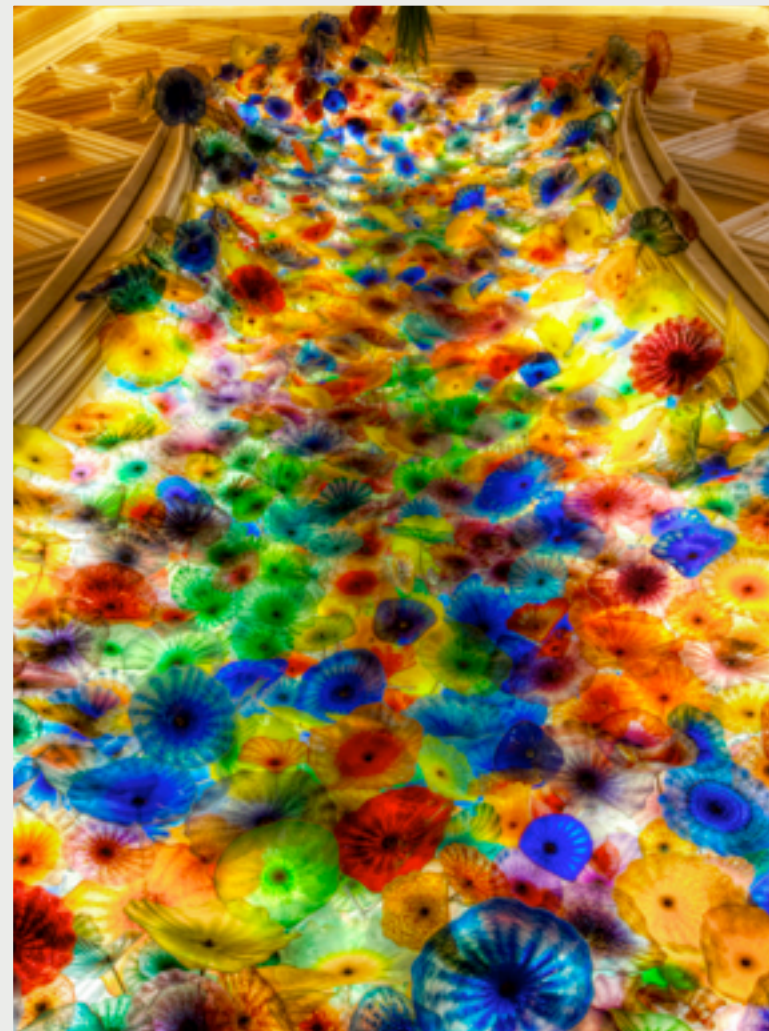
# CHOOSING A FRAMEWORK

- Choose a short list of frameworks to prototype with.
- Create an application prototype with each framework.
- Document findings and create a matrix with important criteria.
- Create presentation to summarize document.
- Deliver document, presentation and recommendation.



# 2011: NOW THERE'S 20

1. Developer Productivity
2. Developer Perception
3. Learning Curve
4. Project Health
5. Developer Availability
6. Job Trends





# 2011: COMPARISON POINTS

- 7. Templating
- 8. Components
- 9. Ajax
- 10. Plugins or Add-Ons
- 11. Scalability
- 12. Testing Support





# 2011: COMPARISON POINTS

13. i18n and l10n

14. Validation

15. Multi-language Support (Groovy / Scala)

16. Quality of Documentation/Tutorials

17. Books Published

18. REST Support (client and server)



# 2011: COMPARISON POINTS

19. Mobile / iPhone Support

20. Degree of Risk





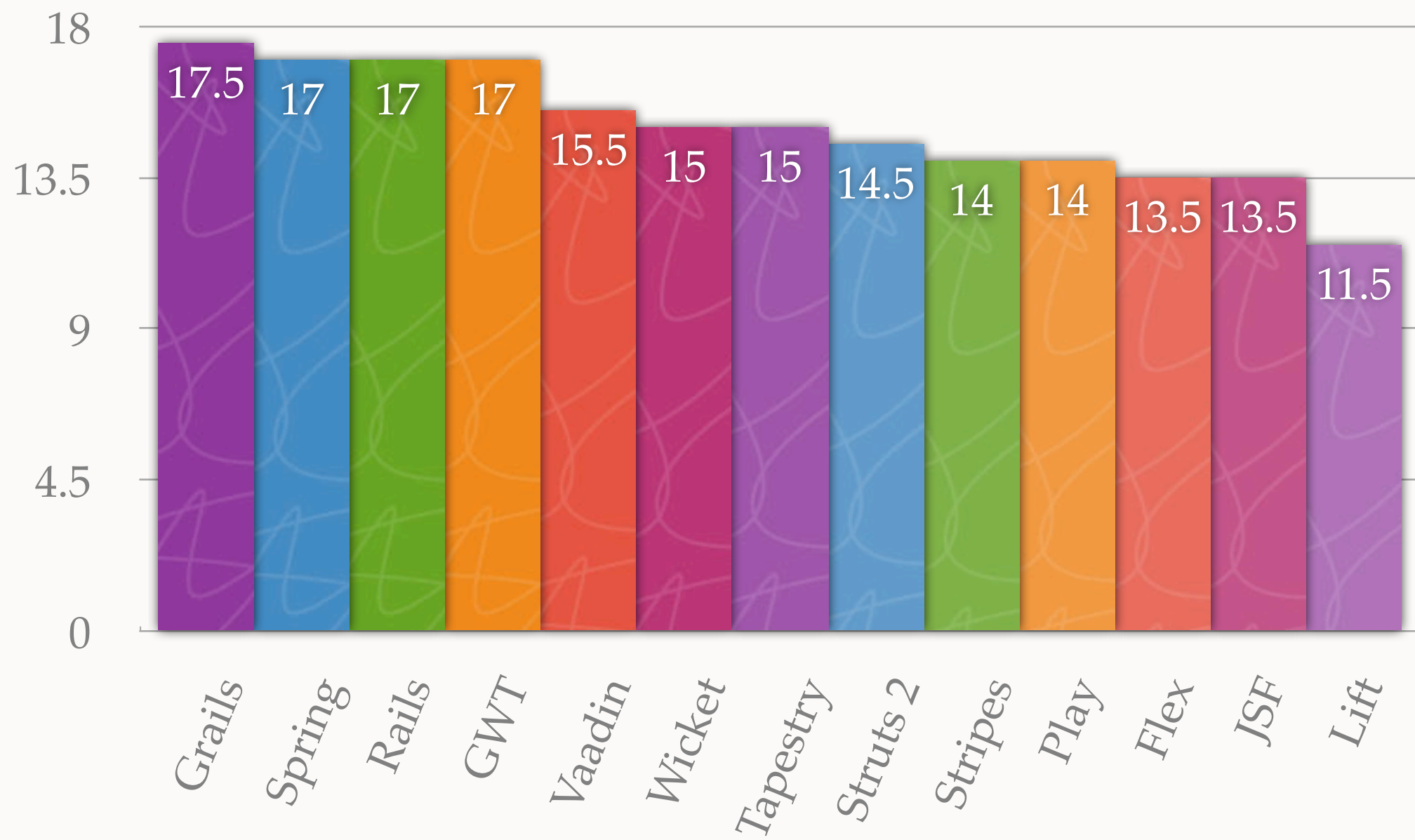
# COMPARISON MATRIX

Criteria	Struts 2	Spring MVC	Wicket	JSF 2	Tapestry	Stripes	GWT	Grails	Rails	Flex	Vaadin	Lift	Play
Developer Productivity	0.50	0.50	0.50	0.50	1.00	0.50	1.00	1.00	1.00	0.00	1.00	0.50	1.00
Developer Perception	0.50	1.00	1.00	0.00	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Learning Curve	1.00	1.00	0.50	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00
Project Health	0.50	1.00	1.00	1.00	0.50	0.50	1.00	1.00	1.00	0.50	1.00	1.00	1.00
Developer Availability	0.50	1.00	0.50	1.00	1.00	0.50	1.00	0.50	1.00	1.00	0.50	0.00	0.50
Job Trends	1.00	1.00	0.50	1.00	0.50	0.00	1.00	0.50	1.00	1.00	0.00	0.00	0.50
Templating	1.00	1.00	1.00	0.50	1.00	1.00	0.50	1.00	1.00	0.50	0.50	0.50	0.50
Components	0.00	0.00	1.00	1.00	1.00	0.00	0.50	0.50	0.50	1.00	1.00	0.00	0.00
Ajax	0.50	1.00	0.50	0.50	0.50	0.50	1.00	0.50	0.50	0.50	1.00	1.00	0.50
Plugins or Add-Ons	0.50	0.00	1.00	1.00	0.50	0.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00
Scalability	1.00	1.00	0.50	0.50	0.50	1.00	1.00	0.50	0.50	0.50	0.50	1.00	1.00
Testing	1.00	1.00	0.50	0.50	1.00	1.00	0.50	1.00	1.00	0.00	0.50	0.50	1.00
i18n and l10n	1.00	1.00	1.00	0.50	1.00	1.00	1.00	1.00	0.50	0.50	1.00	1.00	1.00
Validation	1.00	1.00	1.00	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50
Multi-language Support (Groovy / Scala)	0.50	0.50	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.50
Quality of Documentation/Tutorials	0.50	1.00	0.50	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Books Published	1.00	1.00	0.50	1.00	0.50	0.50	1.00	1.00	1.00	1.00	0.50	0.50	0.00
REST Support (client and server)	0.50	1.00	0.50	0.00	0.50	0.50	0.50	1.00	1.00	0.50	0.50	0.50	0.50
Mobile / iPhone Support	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00	1.00	1.00
Degree of Risk	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50
<b>Totals</b>	<b>14.5</b>	<b>17</b>	<b>15</b>	<b>13.5</b>	<b>15</b>	<b>14</b>	<b>17</b>	<b>17.5</b>	<b>17</b>	<b>13.5</b>	<b>15.5</b>	<b>11.5</b>	<b>14</b>

<http://bit.ly/jvm-frameworks-matrix>



# MATRIX RESULTS





# MATRIX RESULTS

- Grails (17.5)
- GWT (17)
- Ruby on Rails (17)
- Spring MVC (17)
- Vaadin (15.5)
- Tapestry and Wicket (15)





# WEIGHTED MATRIX

Weight	Criteria	Struts 2	Spring MVC	Wicket	JSF	Tapestry	Stripes	GWT	Grails	Rails	Flex	Vaadin	Lift	Play
10	Developer Productivity	5.00	5.00	5.00	5.00	10.00	5.00	10.00	10.00	10.00	0.00	10.00	5.00	10.00
0	Developer Perception	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Learning Curve	5.00	5.00	2.50	2.50	2.50	5.00	5.00	5.00	5.00	5.00	5.00	2.50	5.00
5	Project Health	2.50	5.00	5.00	5.00	2.50	2.50	5.00	5.00	5.00	2.50	5.00	5.00	5.00
5	Developer Availability	2.50	5.00	2.50	5.00	5.00	2.50	5.00	2.50	5.00	5.00	2.50	0.00	2.50
0	Job Trends	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	Templating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	Components	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Ajax	2.50	5.00	2.50	2.50	2.50	2.50	5.00	2.50	2.50	2.50	5.00	5.00	2.50
5	Plugins or Add-Ons	2.50	0.00	5.00	5.00	2.50	0.00	5.00	5.00	5.00	5.00	5.00	2.50	5.00
10	Scalability	10.00	10.00	5.00	5.00	5.00	10.00	10.00	5.00	5.00	5.00	5.00	10.00	10.00
10	Testing	10.00	10.00	5.00	5.00	10.00	10.00	5.00	10.00	10.00	0.00	5.00	5.00	10.00
0	i18n and l10n	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Validation	5.00	5.00	5.00	2.50	5.00	5.00	5.00	5.00	5.00	5.00	5.00	2.50	2.50
10	Multi-language Support (Groovy / Scala)	5.00	5.00	10.00	10.00	10.00	10.00	0.00	10.00	0.00	0.00	10.00	0.00	5.00
10	Quality of Documentation/Tutorials	5.00	10.00	5.00	5.00	5.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
0	Books Published	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	REST Support (client and server)	5.00	10.00	5.00	0.00	5.00	5.00	5.00	10.00	10.00	5.00	5.00	5.00	5.00
10	Mobile / iPhone Support	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	5.00	10.00	10.00	10.00
0	Degree of Risk	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	<b>Weighted Totals</b>	70	85	67.5	62.5	75	77.5	80	90	82.5	50	82.5	62.5	82.5



# WEIGHTED RESULTS

- Grails (90)
- Spring MVC (85)
- Ruby on Rails (82.5)
- Vaadin (82.5)
- Play (82.5)
- GWT (80)





# FIGHTING FOR 5TH

- **Top at Devoxx 2010**
  - GWT
  - Rails
  - Spring MVC
  - Grails
  - Wicket / Struts 2



# FIGHTING FOR 5TH

- Top at Rich Web Experience 2010
  - Grails
  - GWT
  - Rails
  - Spring MVC
  - Tapestry / Vaadin



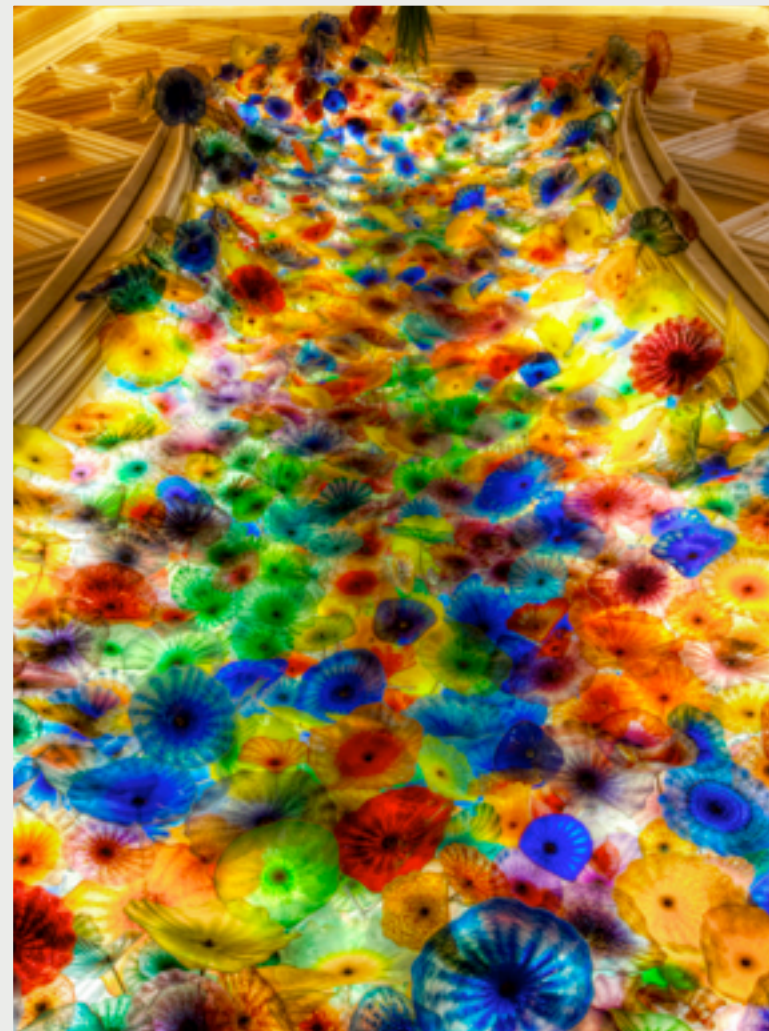
# FIGHTING FOR 5TH

- Top at TheServerSide Java Symposium 2010
  - Grails
  - GWT
  - Rails
  - Spring MVC
  - Vaadin



# RATINGS LOGIC

1. Developer Productivity
2. Developer Perception
3. Learning Curve
4. Project Health
5. Developer Availability
6. Job Trends





# RATINGS LOGIC

- 7. Templating
- 8. Components
- 9. Ajax
- 10. Plugins or Add-Ons
- 11. Scalability
- 12. Testing Support





# RATINGS LOGIC

13. i18n and l10n

14. Validation

15. Multi-language Support (Groovy / Scala)

16. Quality of Documentation/Tutorials

17. Books Published

18. REST Support (client and server)

# RATINGS LOGIC

19. Mobile / iPhone Support

20. Degree of Risk



[http://raibledesigns.com/rd/entry/how\\_i\\_calculated\\_ratings\\_for](http://raibledesigns.com/rd/entry/how_i_calculated_ratings_for)



# DAVID POLLACK'S LIFT RATINGS

- Developer Productivity: Lift gets a 11, Rails gets a 5, most Java-based frameworks get a 1 or less.
- Developer Perception: Every web framework gets a 1.
- Learning Curve: Lift gets a 2.
- Job Trends, yep, it's zero.

\* Matt's scale is 0-1 and my ratings are on Matt's scale, except mine goes to 11.

<http://lift.la/my-take-on-matt-raibles-spreadsheet>

# PETER THOMAS'S PERFBENCH

- Seam / JSF vs. Wicket Performance Comparison
- January 2009: Seam 2.1.1 and Wicket 1.3.5
- Average page response time in milliseconds

	Seam / JSF						Wicket				
action	users-1	users-5	users-10	users-15	users-20		users-1	users-5	users-10	users-15	users-20
get login	569	521	406	385	747		154	40	37	45	63
post login	392	626	979	973	1189		303	166	191	268	296
ajax post search	35	117	158	288	336		15	40	95	152	224
get view hotel	19	106	154	250	294		8	43	49	88	82
post book hotel	28	71	118	181	207		28	43	82	77	96
ajax post cc number	23	59	84	148	152		4	11	19	28	23
ajax post cc name	18	61	88	132	119		3	3	10	22	18
post booking details	16	52	111	149	105		9	20	37	53	42
post confirm booking	33	126	273	488	756		29	159	317	471	808
get logout	15	24	292	107	180		8	58	71	44	46



# PETER THOMAS'S PERFBENCH

- On the Seam / JSF side, the 20 sessions each take up about 800 KB adding up to around 16 MB total. On the Wicket side the 20 sessions add up to around 1.5 MB.

	Seam / JSF	Wicket
Heap Size (bytes)	23,947,512	9,496,312
Classes	6,344	4,489
Objects	585,123	179,028
Class Loaders	370	234

- + Lots of banter between Peter and Seam developers @ <http://bit.ly/3X50Gc>

# PETER THOMAS'S PERFBENCH

- Peter's Observations:
  - Grails was far more productive than Tapestry 5.
  - Grails still has some ways to go in terms of performance.
  - Overall, Wicket is fastest, with Tapestry coming a close second.
  - Wicket takes up the least amount of heap.
  - Session usage of the Seam + JSF combination is significantly higher compared to the rest.



# PROS AND CONS





# GRAILS

- **Pros**

- Easy dynamic language transition for Java Developers
- Groovy
- Plugins for all types of applications

- **Cons**

- Groovy learning targets Java Developers
- Stack traces are horrendous
- Knowledge of underlying frameworks not required, but helpful



# GWT

- **Pros**

- Write Java => Produces Optimized JavaScript
- Easy to learn and develop with standard Java Tools
- Vibrant Community

- **Cons**

- You have to know Java
- Slow to compile, difficult to test
- More like a JSP Tag Library than a web framework

# RUBY ON RAILS

## ● Pros

- Easy to learn and understand for Web Developers
- Lots and lots of documentation
- Passionate Community

## ● Cons

- Slightly less performant by default
- Dynamic language means more tests
- Development Tools and Debugging



# SPRING MVC

## ● Pros

- Easy Configuration with Annotations and Conventions
- Integrates with many view options seamlessly: JSP / JSTL, Tiles, FreeMarker, Excel, PDF, JSON
- Excellent REST Support

## ● Cons

- Instant reload not built-in, need JRebel or Spring Roo
- No open development process, need to be SpringSource
- Ajax requires 3rd-party library (can be a good thing!)

# VAADIN

## ● Pros

- Uses GWT API for developing view.
- Vibrant Community and company backing.
- Excellent Themes and Layouts support.

## ● Cons

- Large memory footprint, state stored in session.
- All client interactions communicate with server.
- Joonas keeps telling me my cons are wrong.



# WICKET

- **Pros**

- Great for Java Developers
- Tight binding between pages and views
- Active community - support from creators

- **Cons**

- No Jobs or Developers
- Stateful by default
- HTML Templates live next to Java code by default

# TAPESTRY

- **Pros**

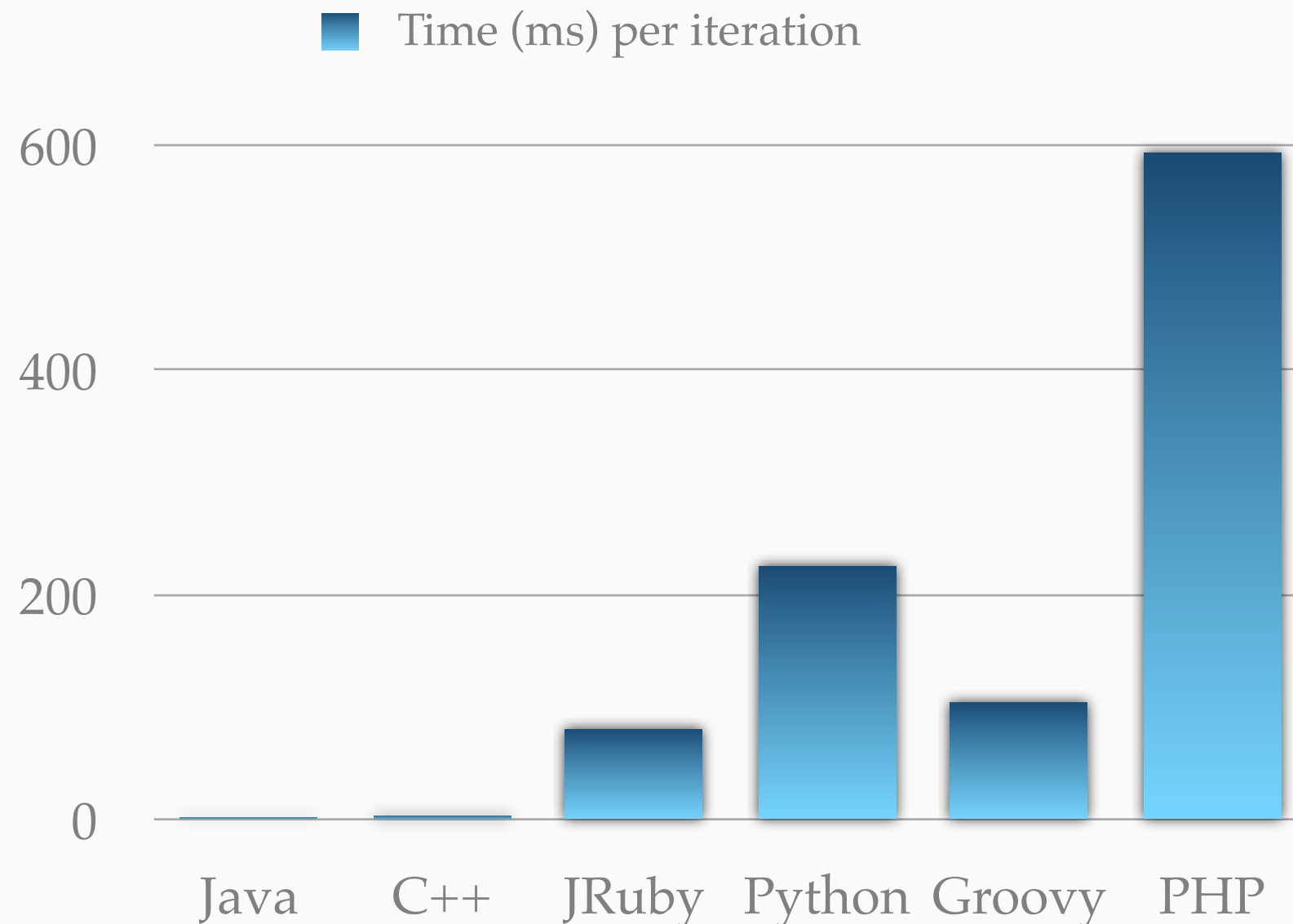
- Live Class Reloading
- Development emphasis on performance and scalability
- Excellent Exception Reporting

- **Cons**

- No Jobs
- Prototype baked in for JS Library
- Annotations vs. Conventions

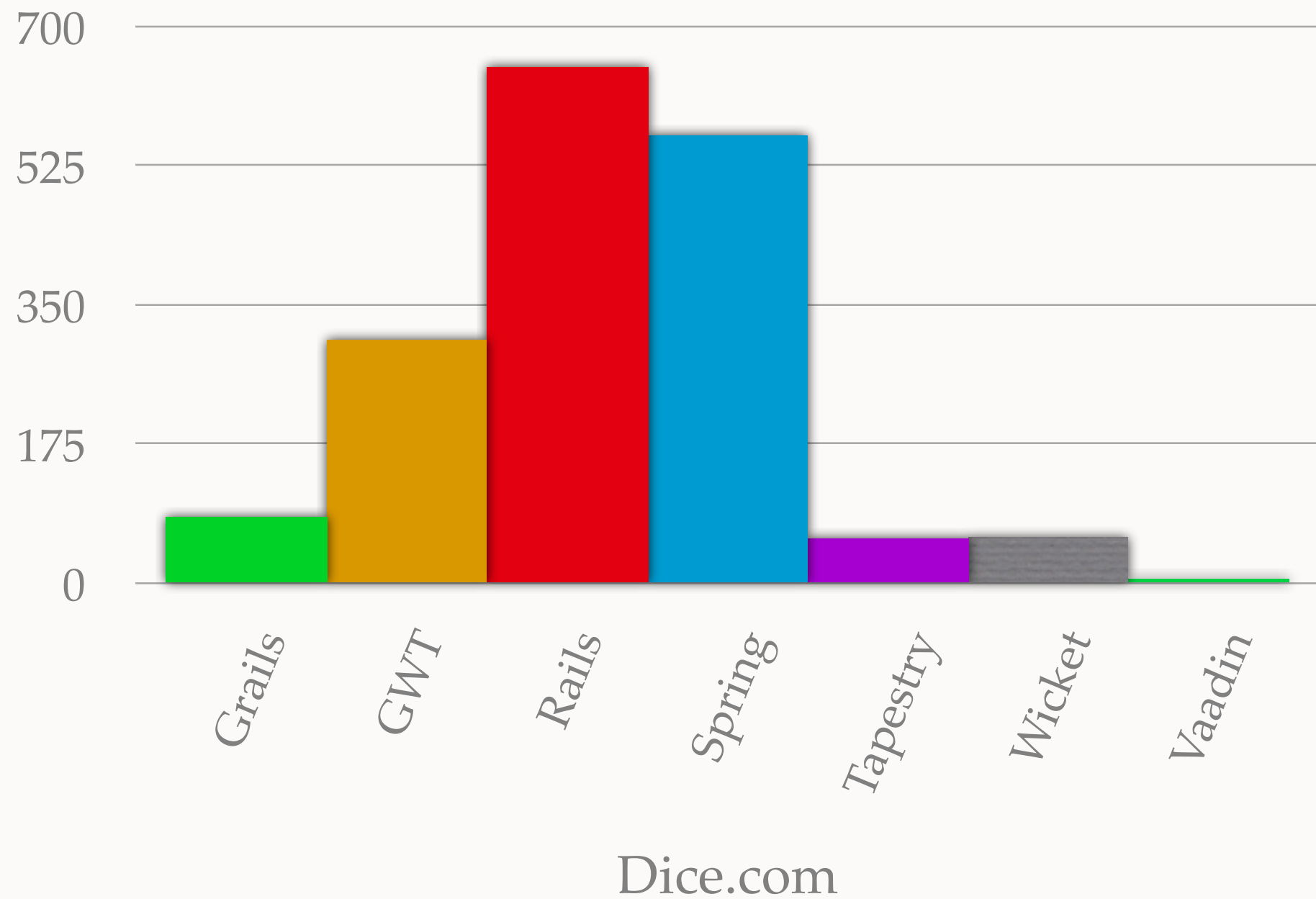


# LANGUAGE PERFORMANCE



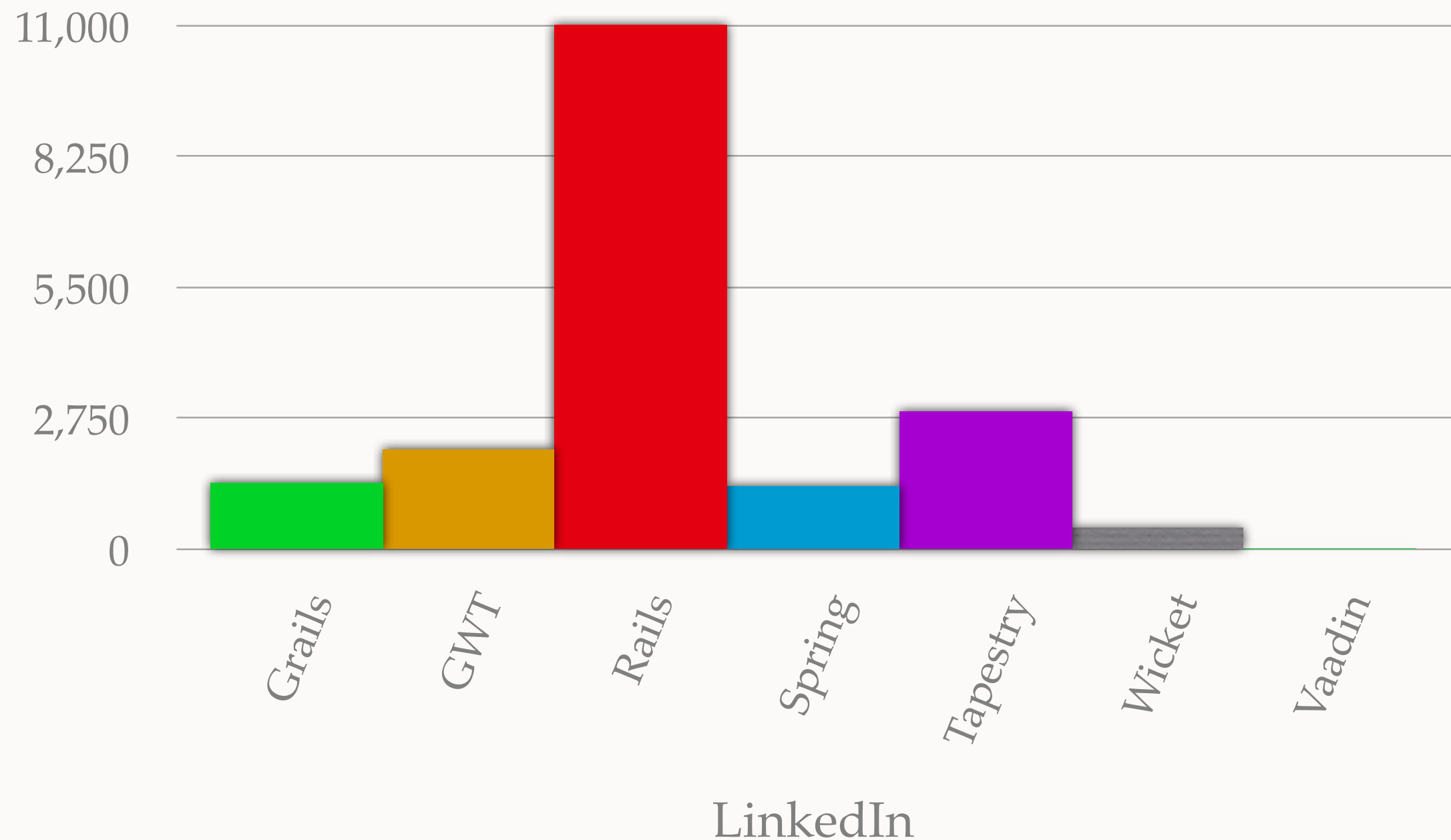
<http://blog.dhananjaynene.com/2008/07/performance-comparison-c-java-python-ruby-jython-jruby-groovy/>

# JOBS IN 2011 (US)





# DEVELOPER SKILLS (US)



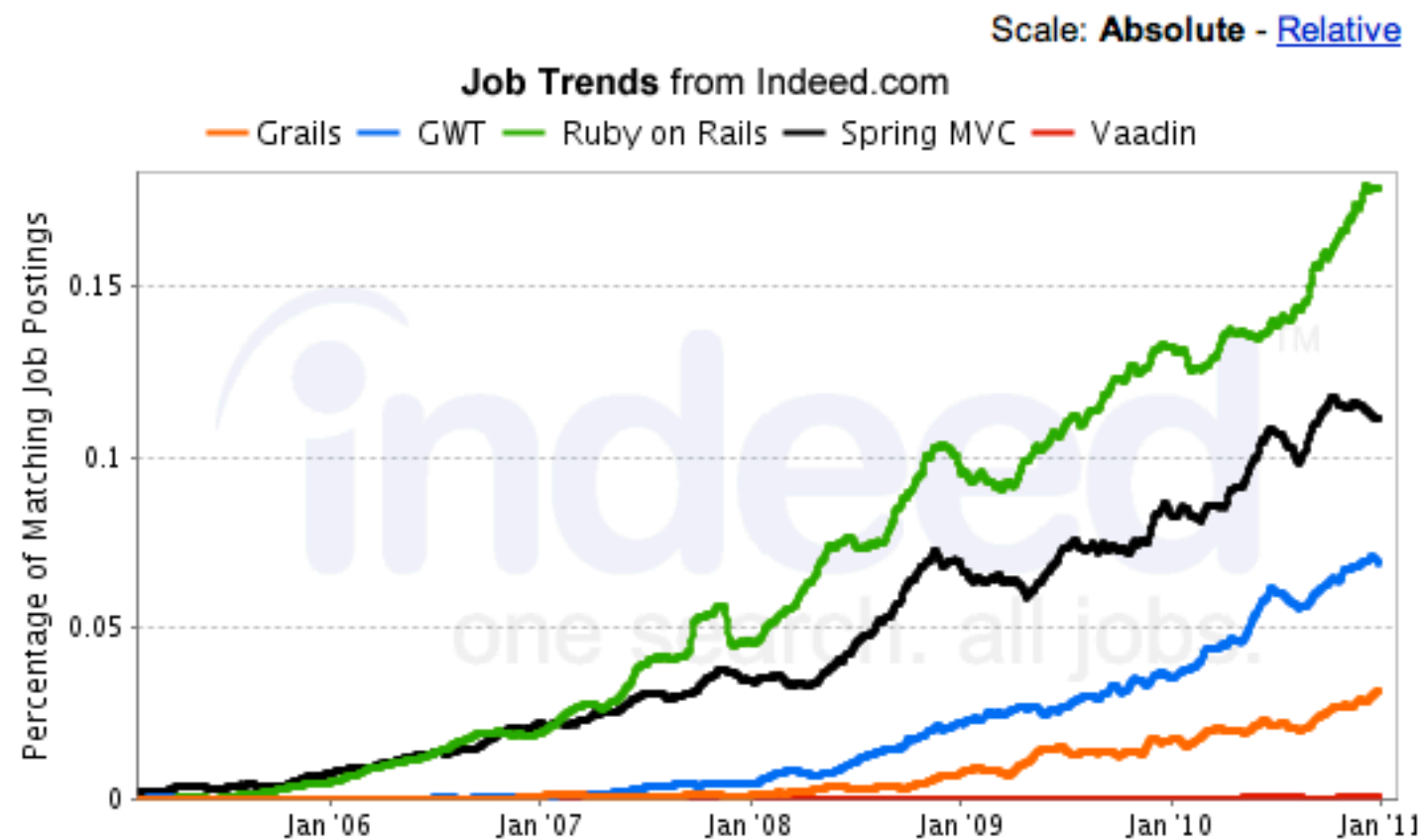
# PRETTY GRAPHS





# PRETTY GRAPHS

## Grails, GWT, Ruby on Rails, Spring MVC, Vaadin Job Trends



Indeed.com searches millions of jobs from thousands of job sites.  
This job trends graph shows the percentage of jobs we find that contain your search terms.

► [Email to a friend](#)

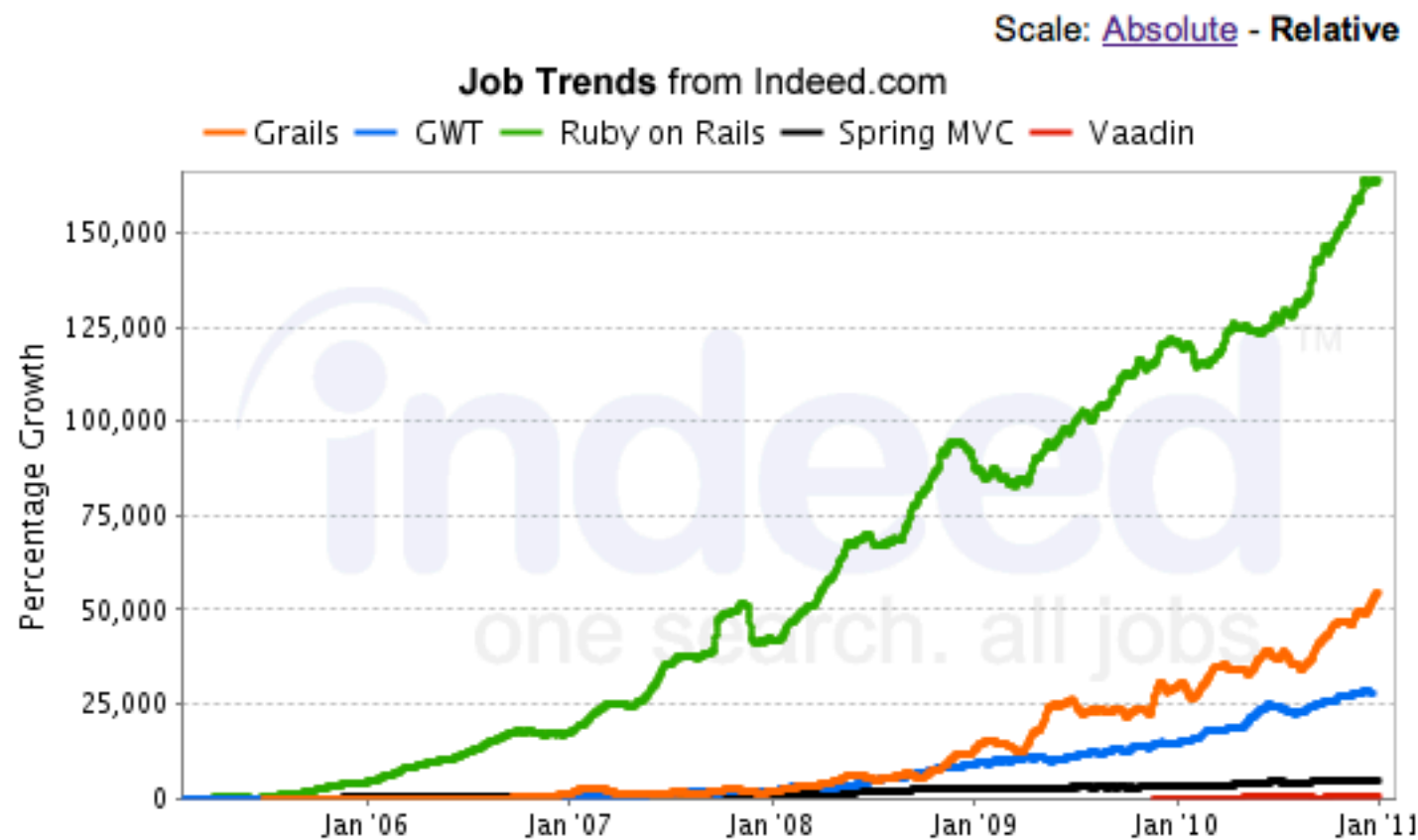
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### Top Job Trends

1. [HTML5](#)
2. [Mobile app](#)
3. [Android](#)
4. [Twitter](#)
5. [jQuery](#)
6. [Facebook](#)
7. [Social Media](#)
8. [iPhone](#)
9. [Cloud Computing](#)
10. [Virtualization](#)

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## Grails, GWT, Ruby on Rails, Spring MVC, Vaadin Job Trends



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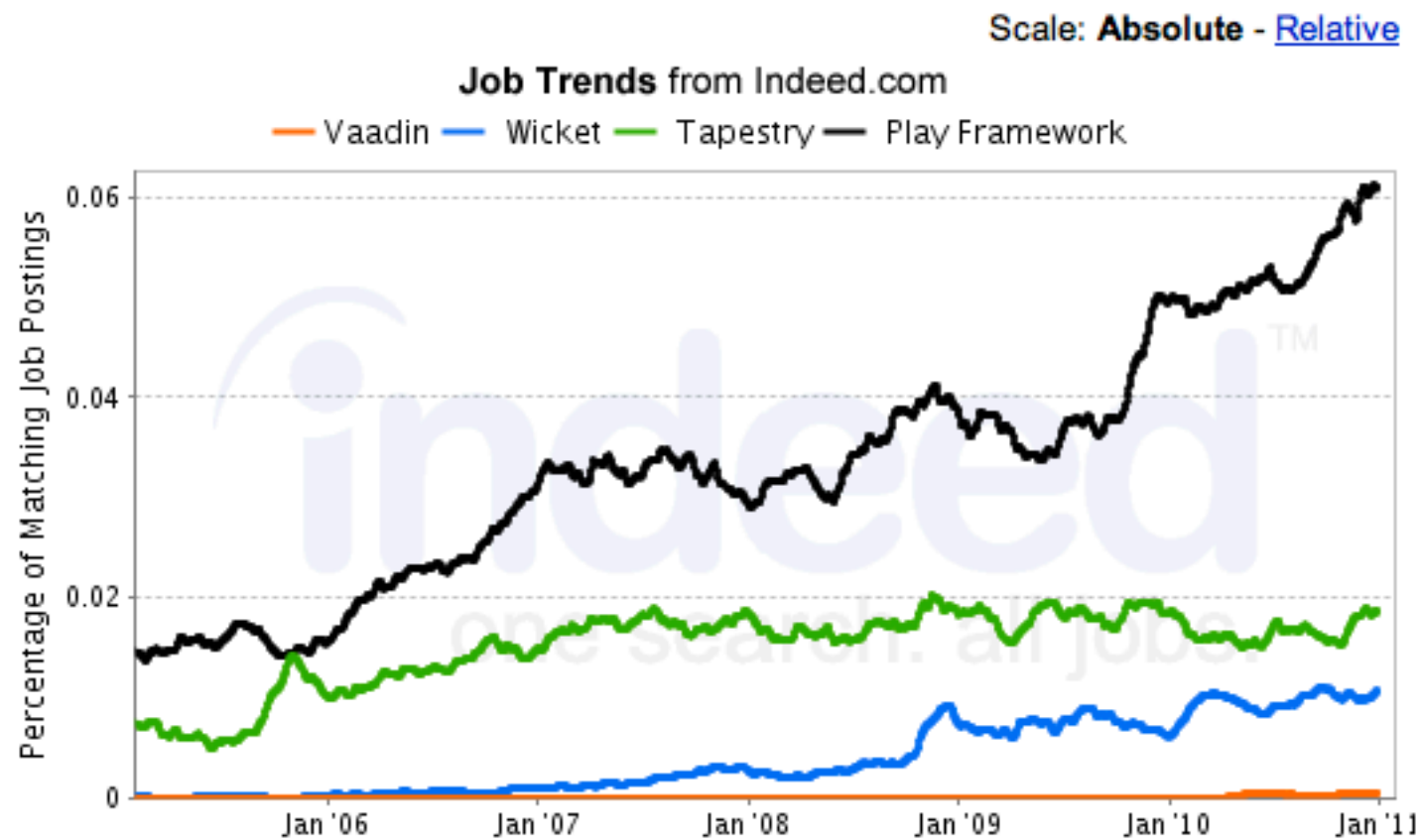
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# PRETTY GRAPHS

## Vaadin, Wicket, Tapestry, Play Framework Job Trends



Indeed.com searches millions of jobs from thousands of job sites.  
This job trends graph shows the percentage of jobs we find that contain your search terms.

► [Email to a friend](#)

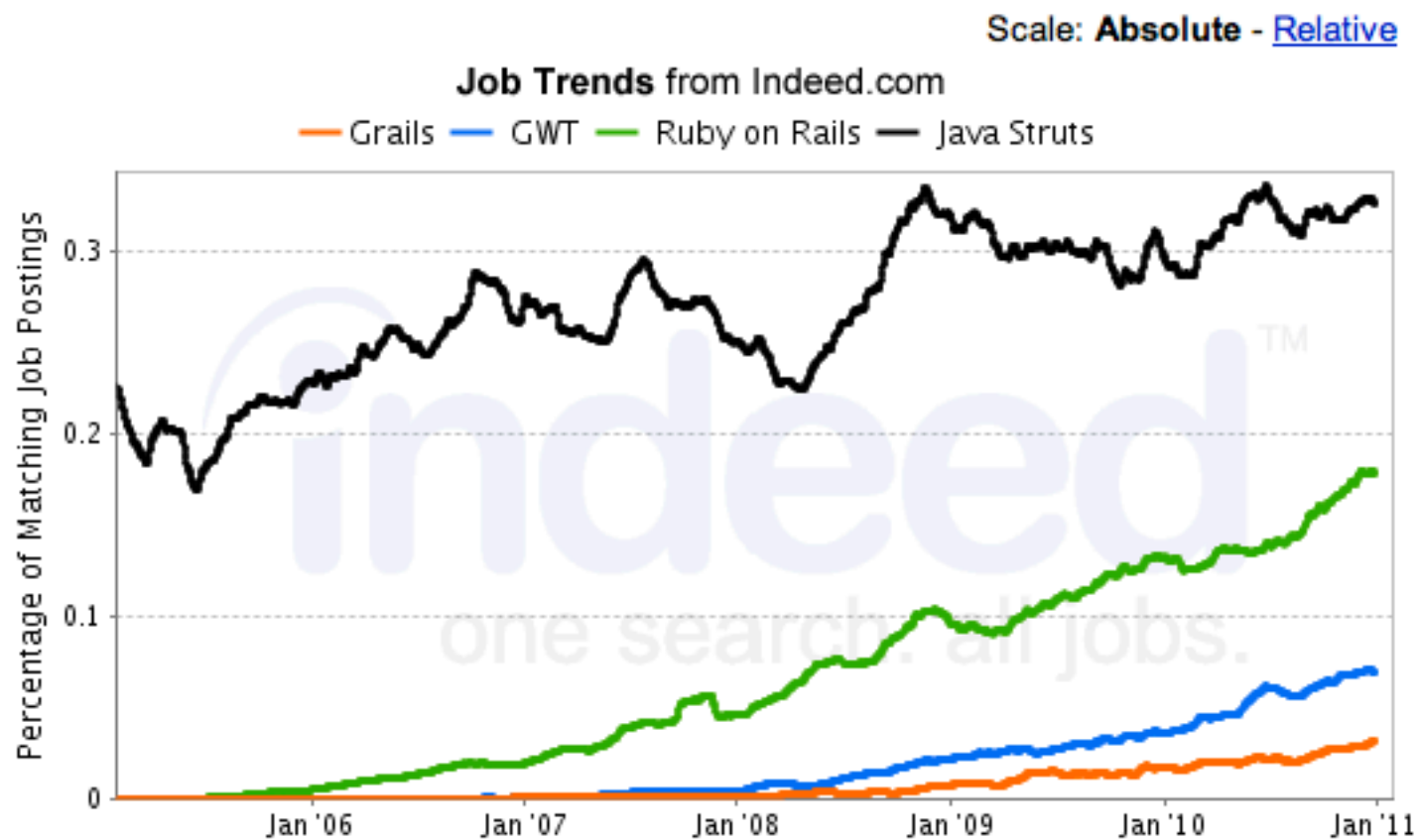
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# PRETTY GRAPHS

## Grails, GWT, Ruby on Rails, Java Struts Job Trends



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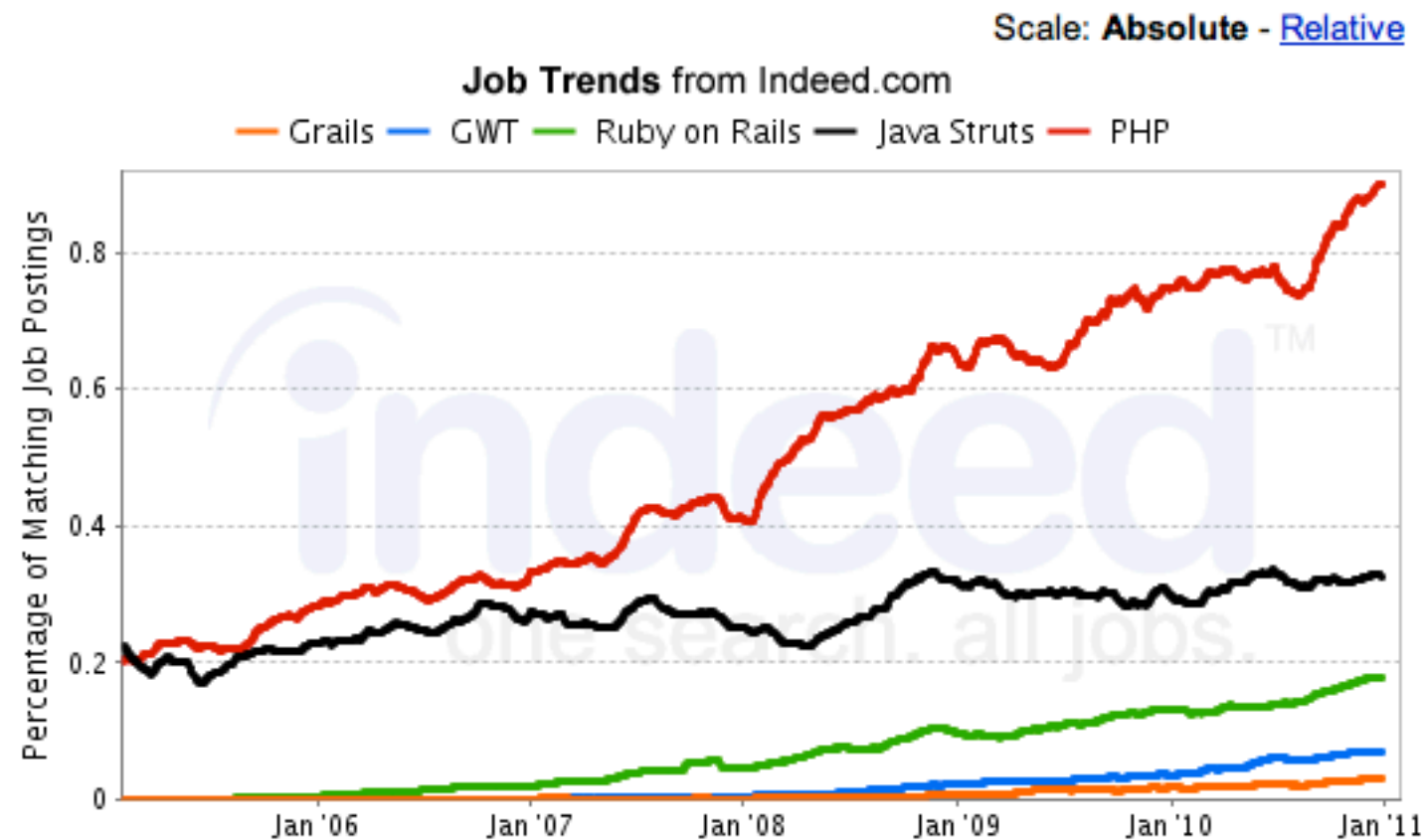
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# PRETTY GRAPHS

## Grails, GWT, Ruby on Rails, Java Struts, PHP Job Trends



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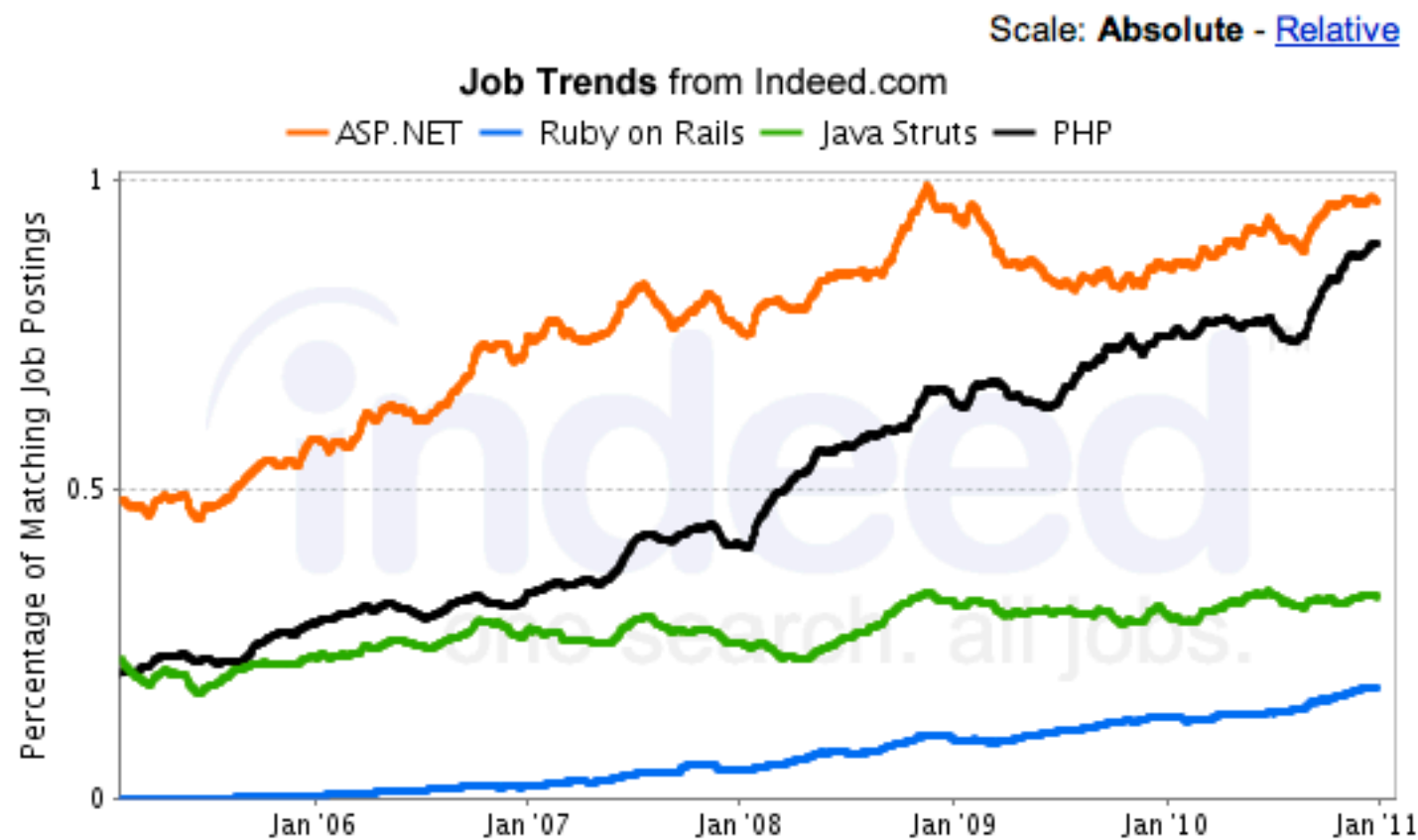
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# PRETTY GRAPHS

## ASP.NET, Ruby on Rails, Java Struts, PHP Job Trends



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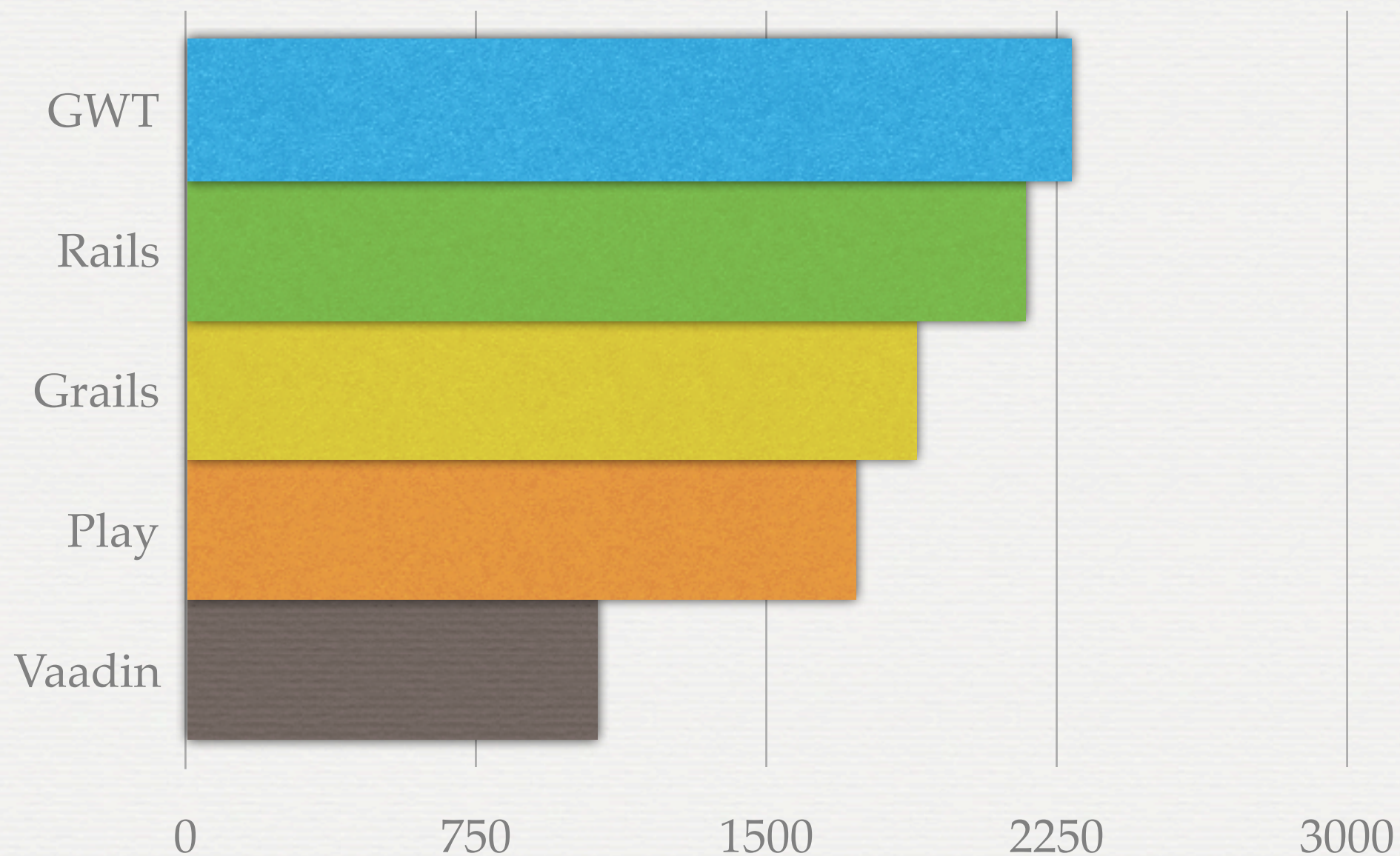
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# MAILING LIST TRAFFIC

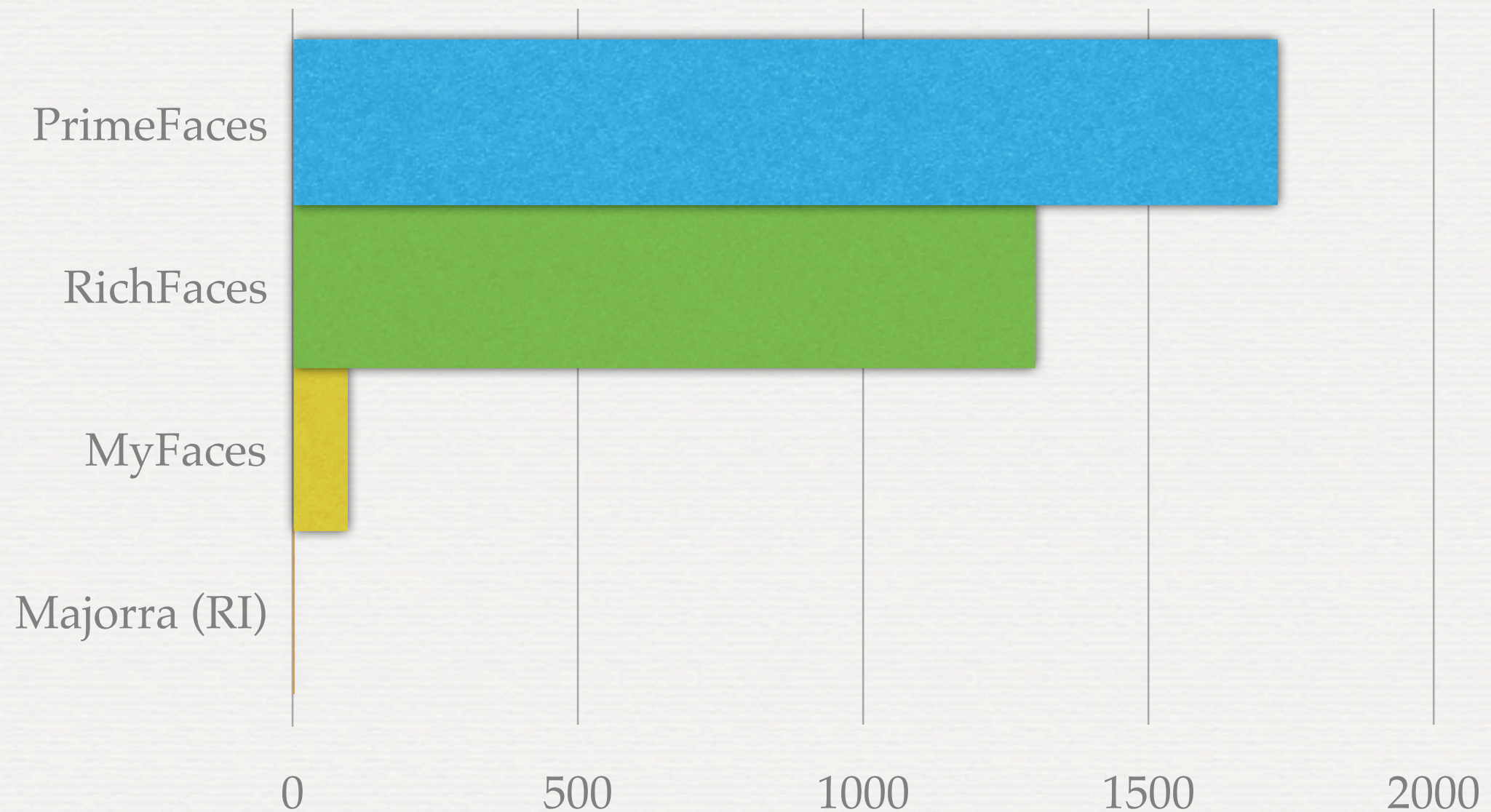


January 2011

\* Spring MVC uses Forums, which don't provide this data.



# JSF LIST TRAFFIC

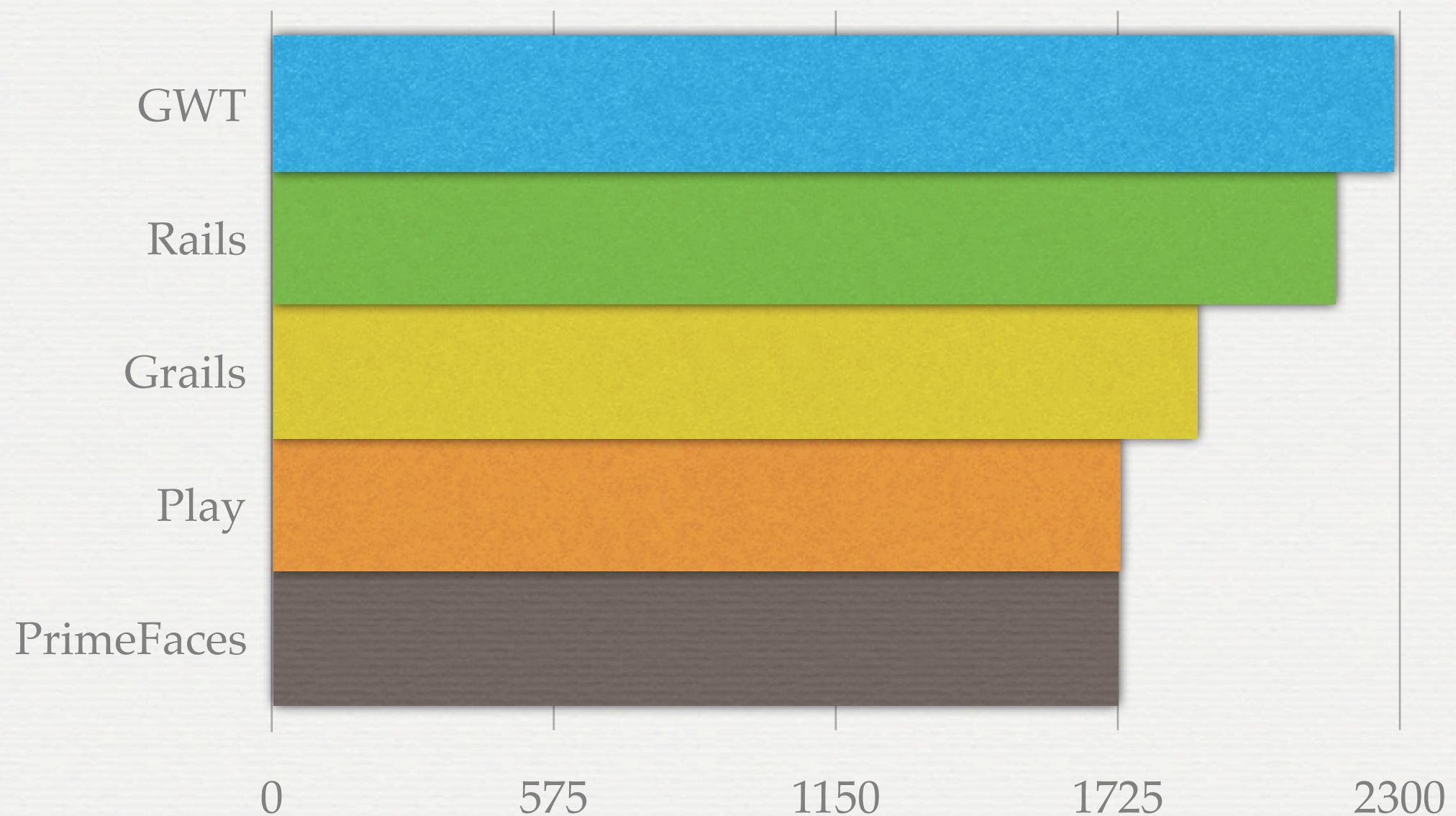


January 2011

\* ICEfaces uses Forums, which don't provide this data.



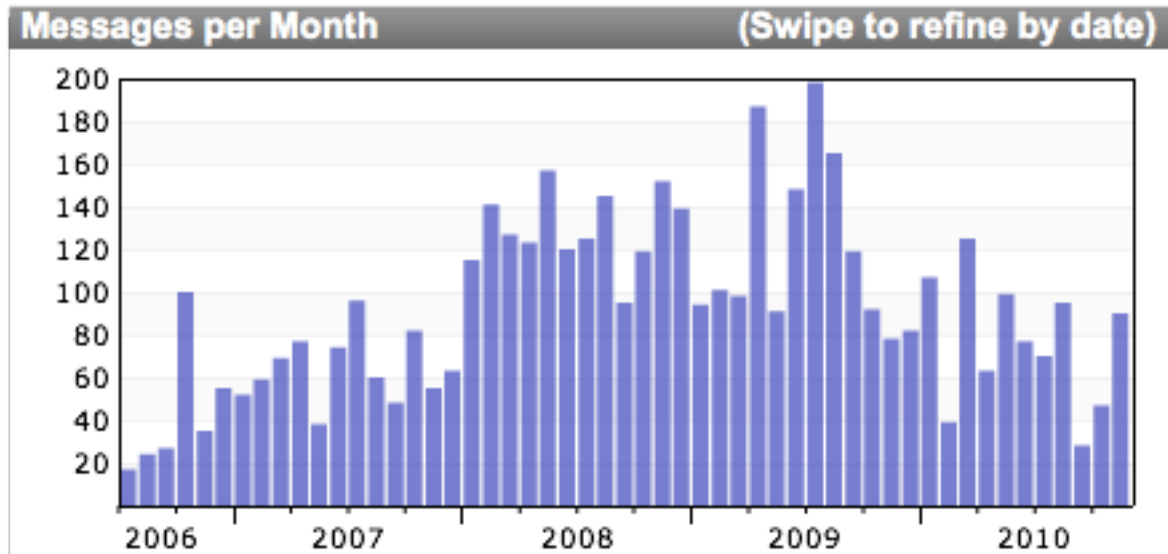
# MAILING LIST TRAFFIC



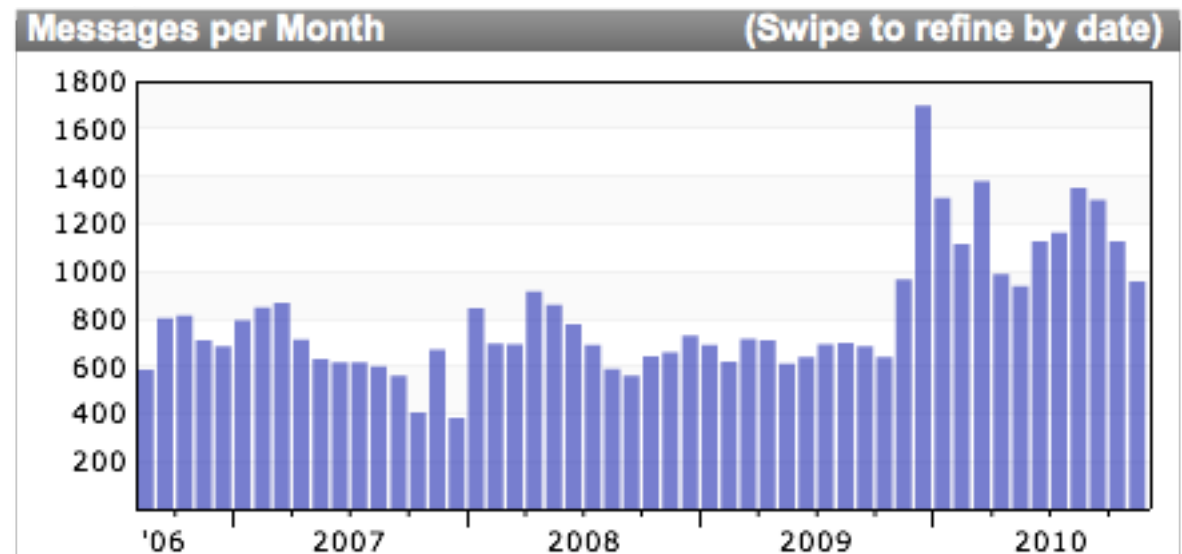
January 2011

\* Spring MVC and Vaadin use Forums, which don't provide this data.

# MAILING LIST TRENDS



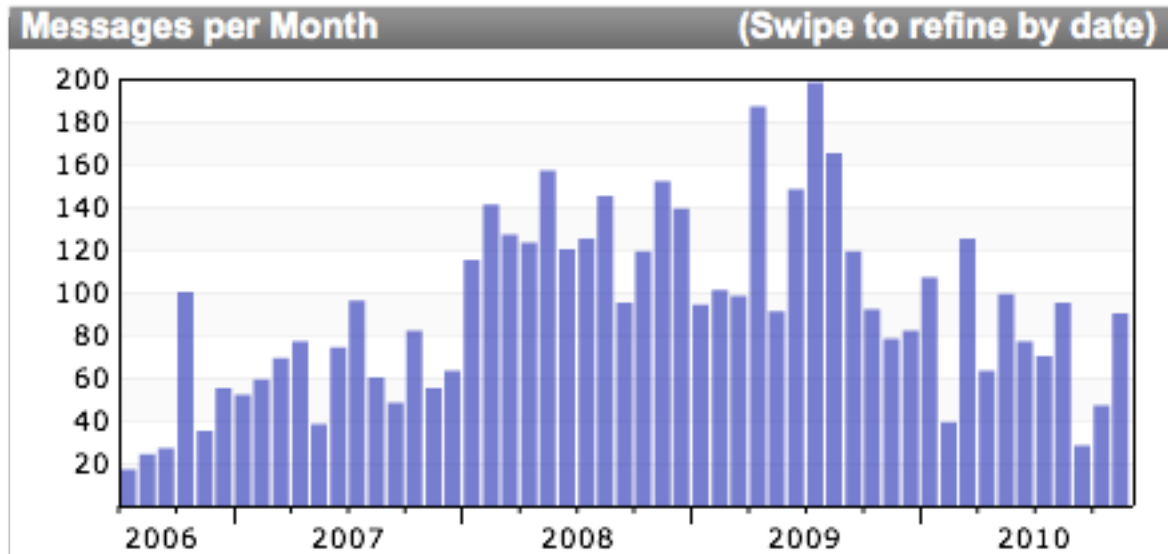
JRuby



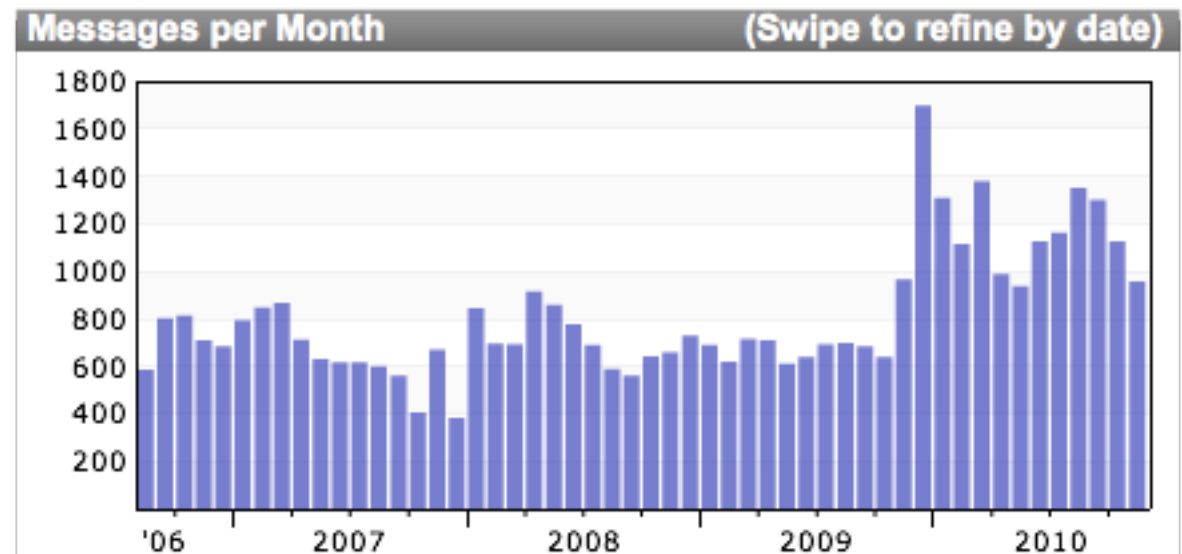
Ruby on Rails



# MAILING LIST TRENDS



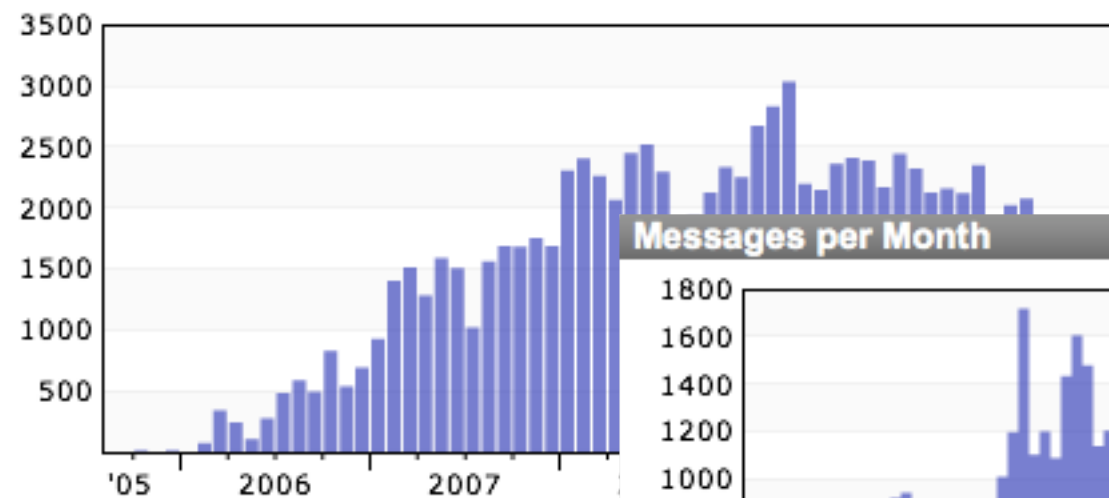
JRuby



Ruby on Rails

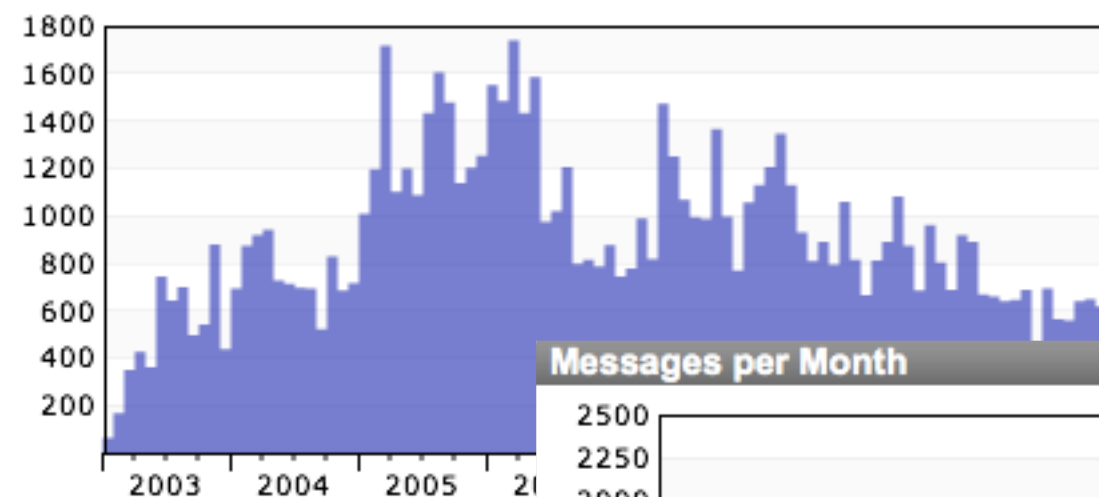
# MAILING LIST TRENDS

Messages per Month (Swipe to refine by date)



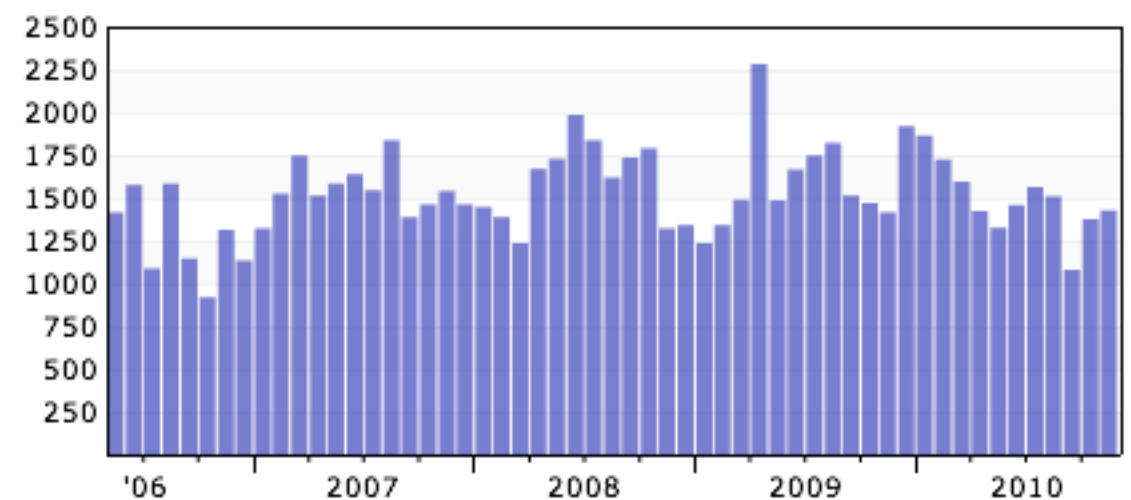
Grail

Messages per Month (Swipe to refine by date)



Tap

Messages per Month (Swipe to refine by date)

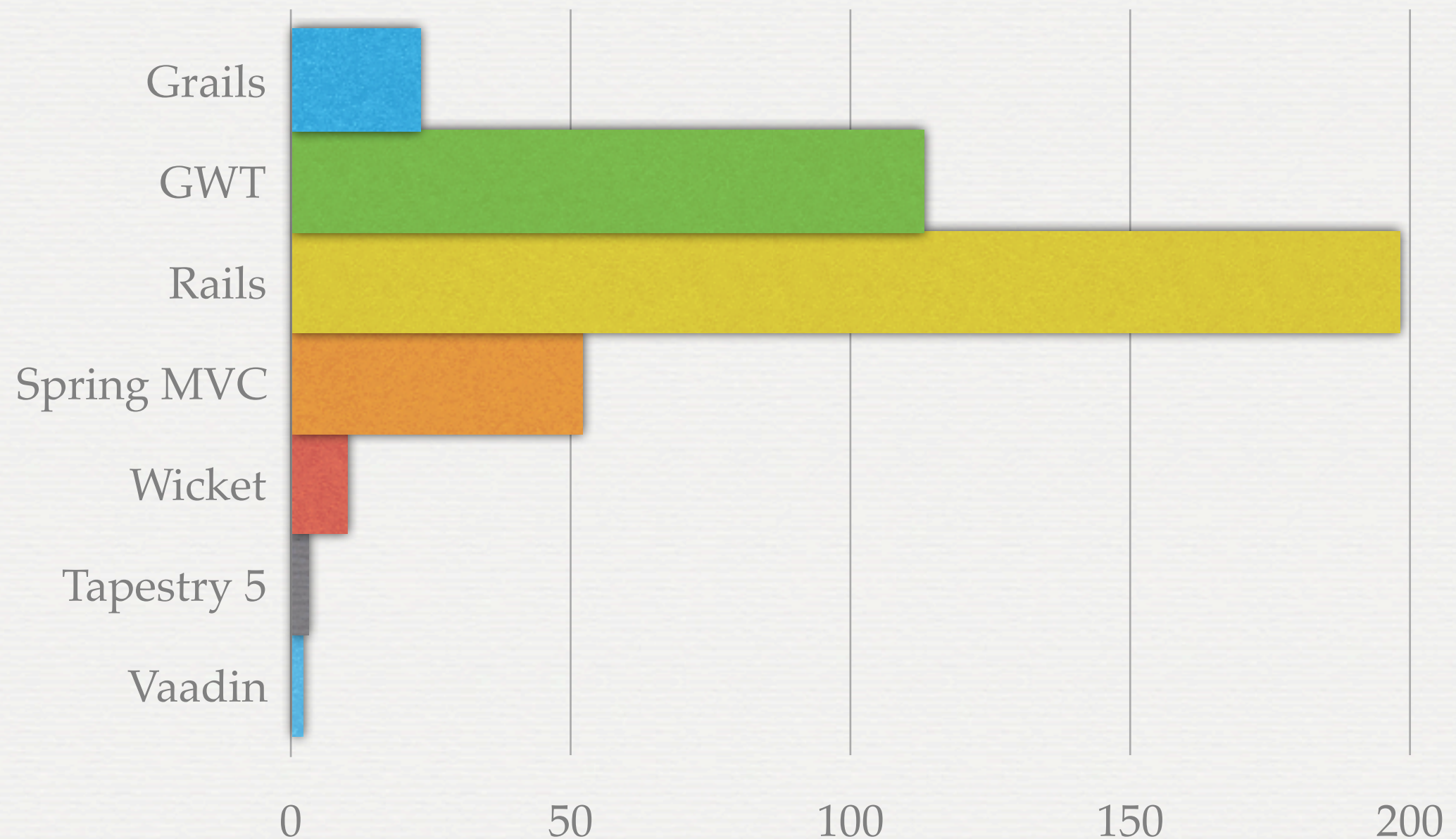


GWT

Source: <http://markmail.org>



# BOOKS ON AMAZON

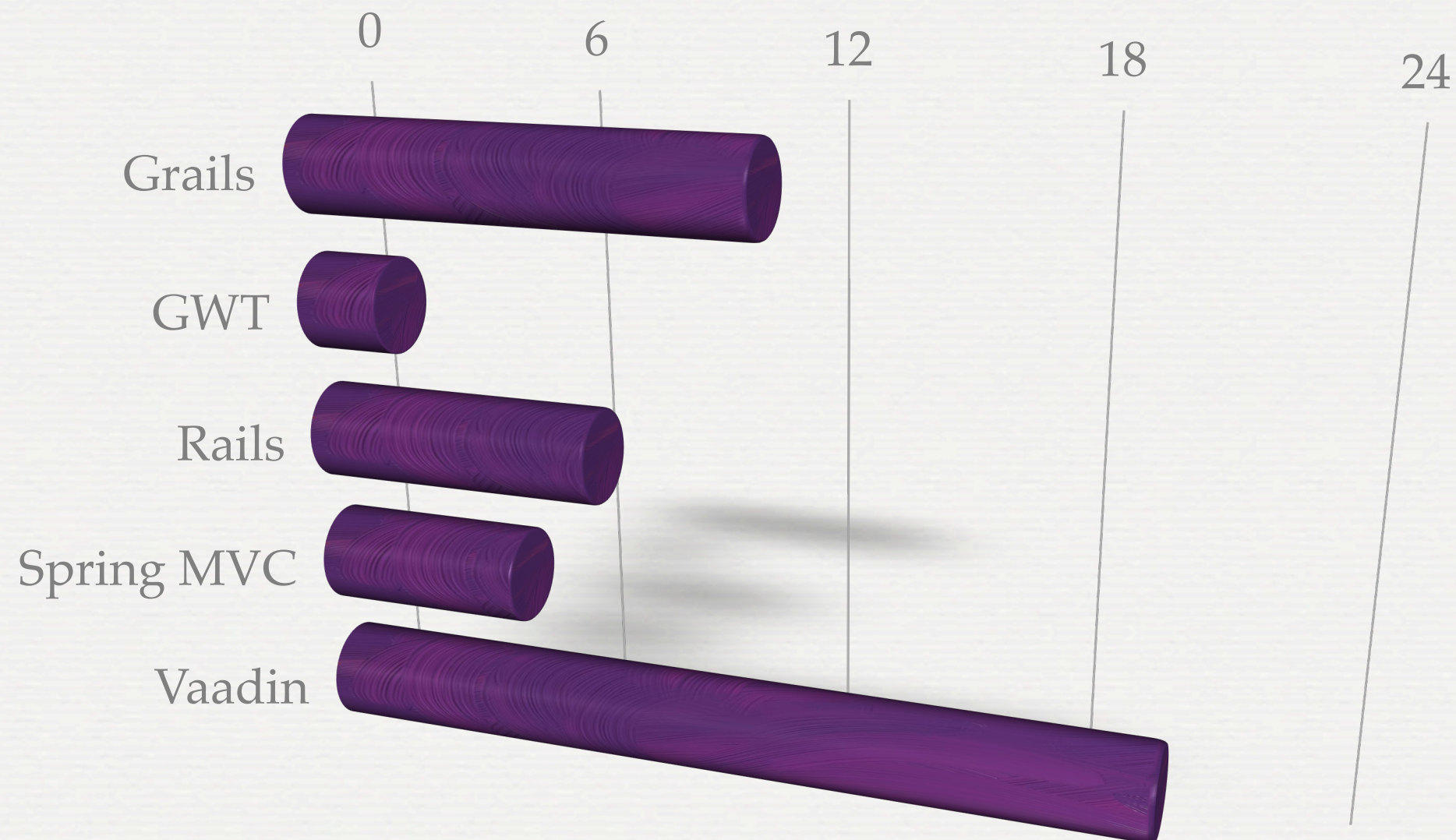


January 2011



# 2010 RELEASES

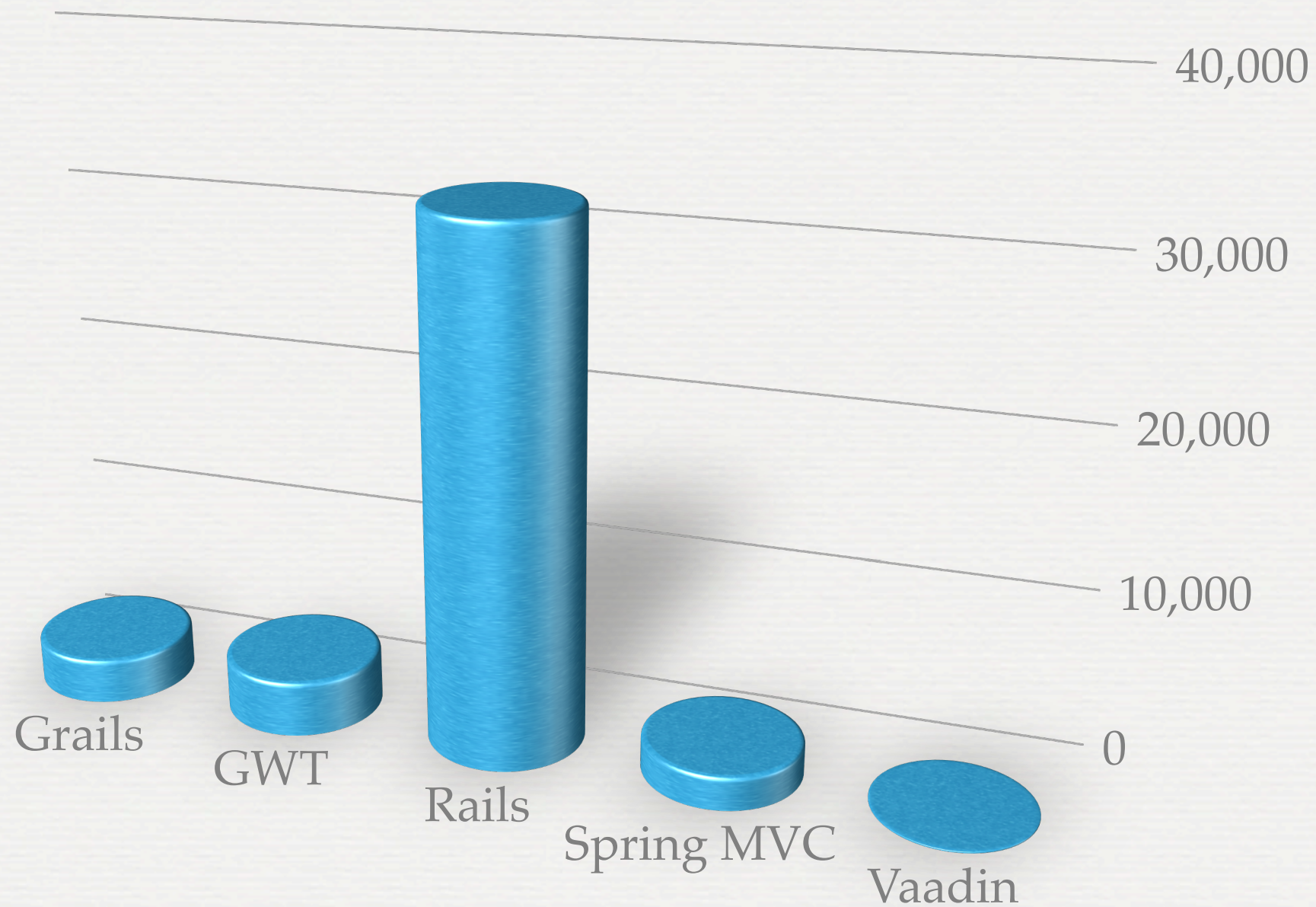
■ As of October 28, 2010





# STACKOVERFLOW

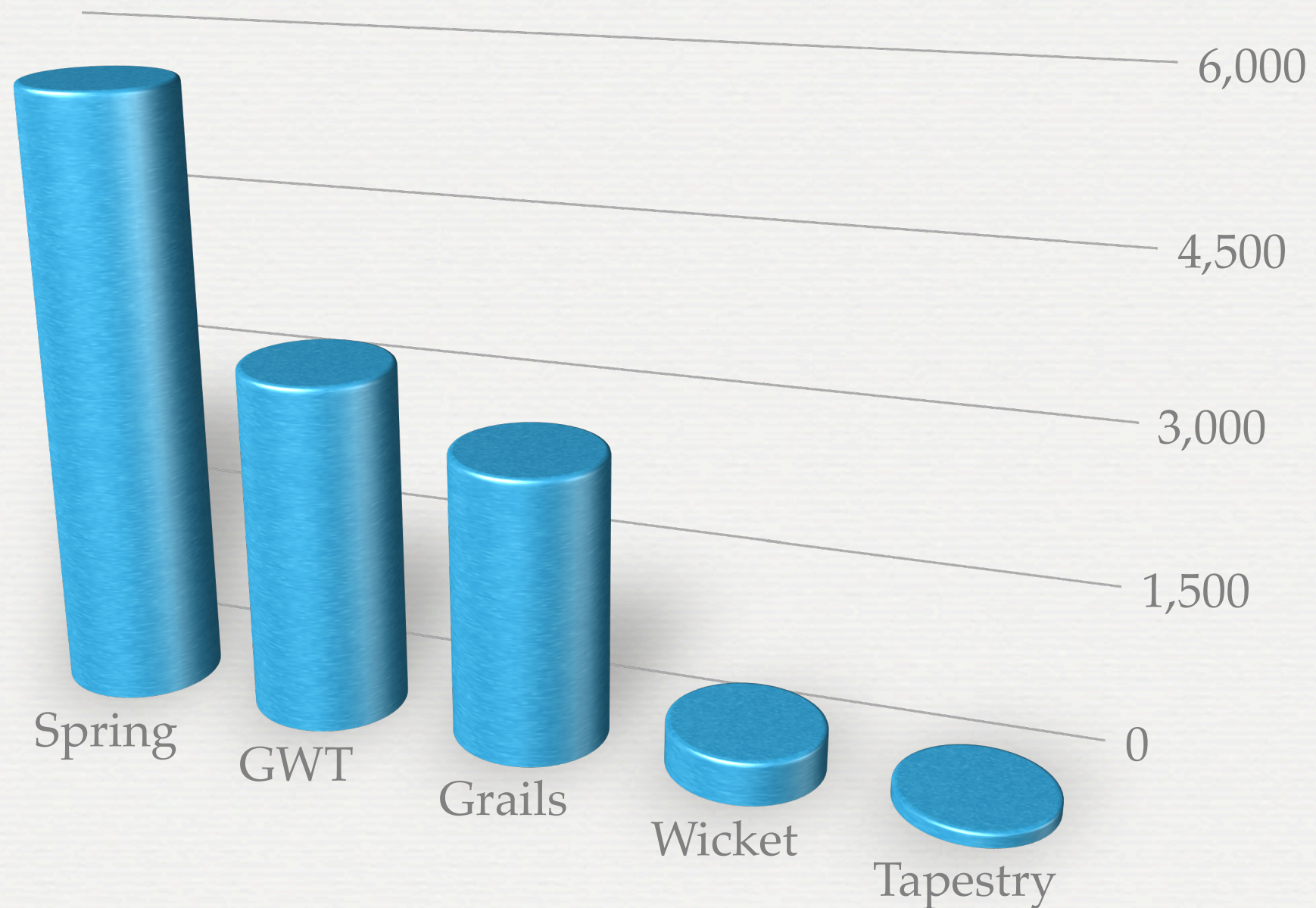
■ Tagged Questions (March 8, 2011)





# STACKOVERFLOW

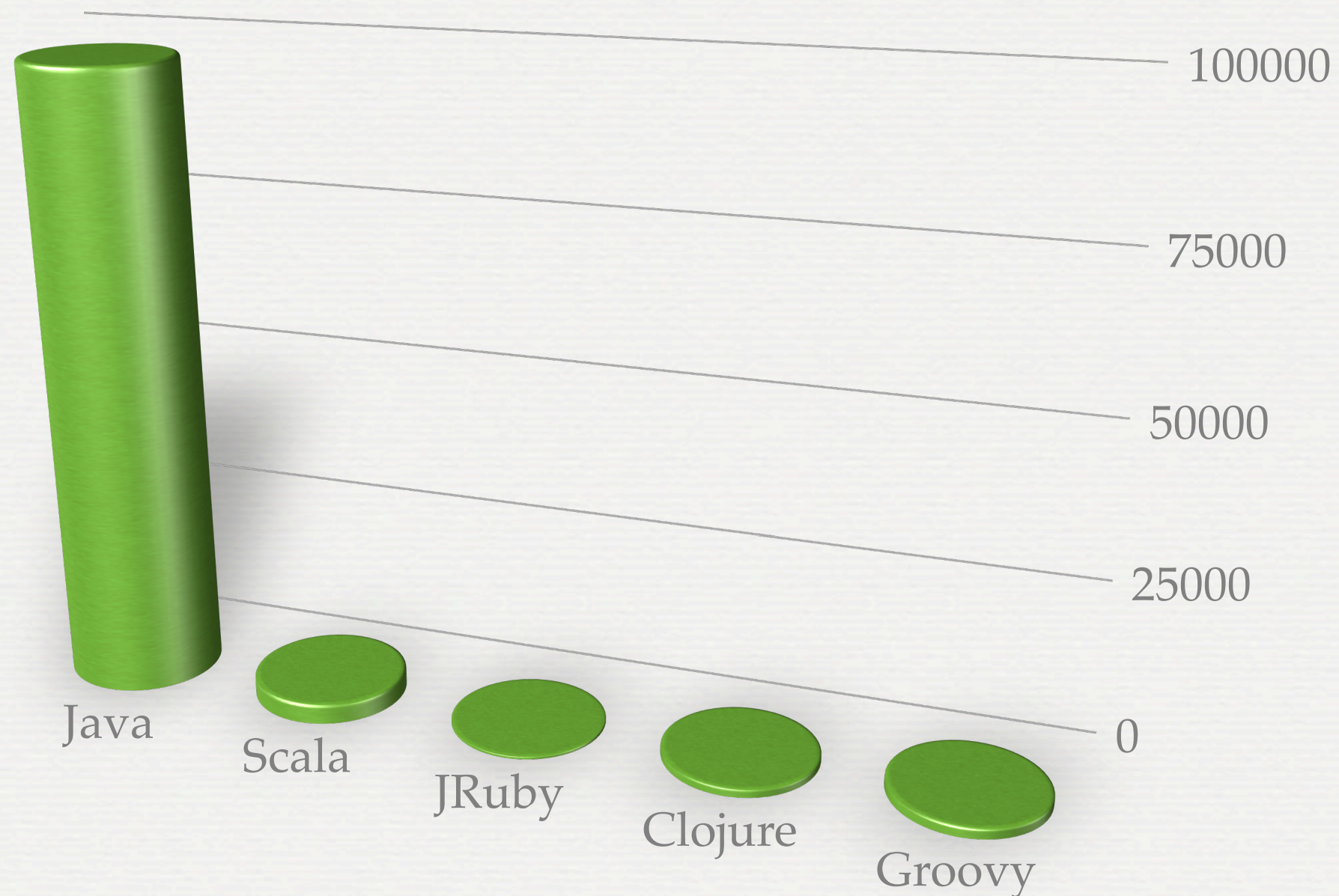
■ Tagged Questions (February 15, 2011)





# STACKOVERFLOW

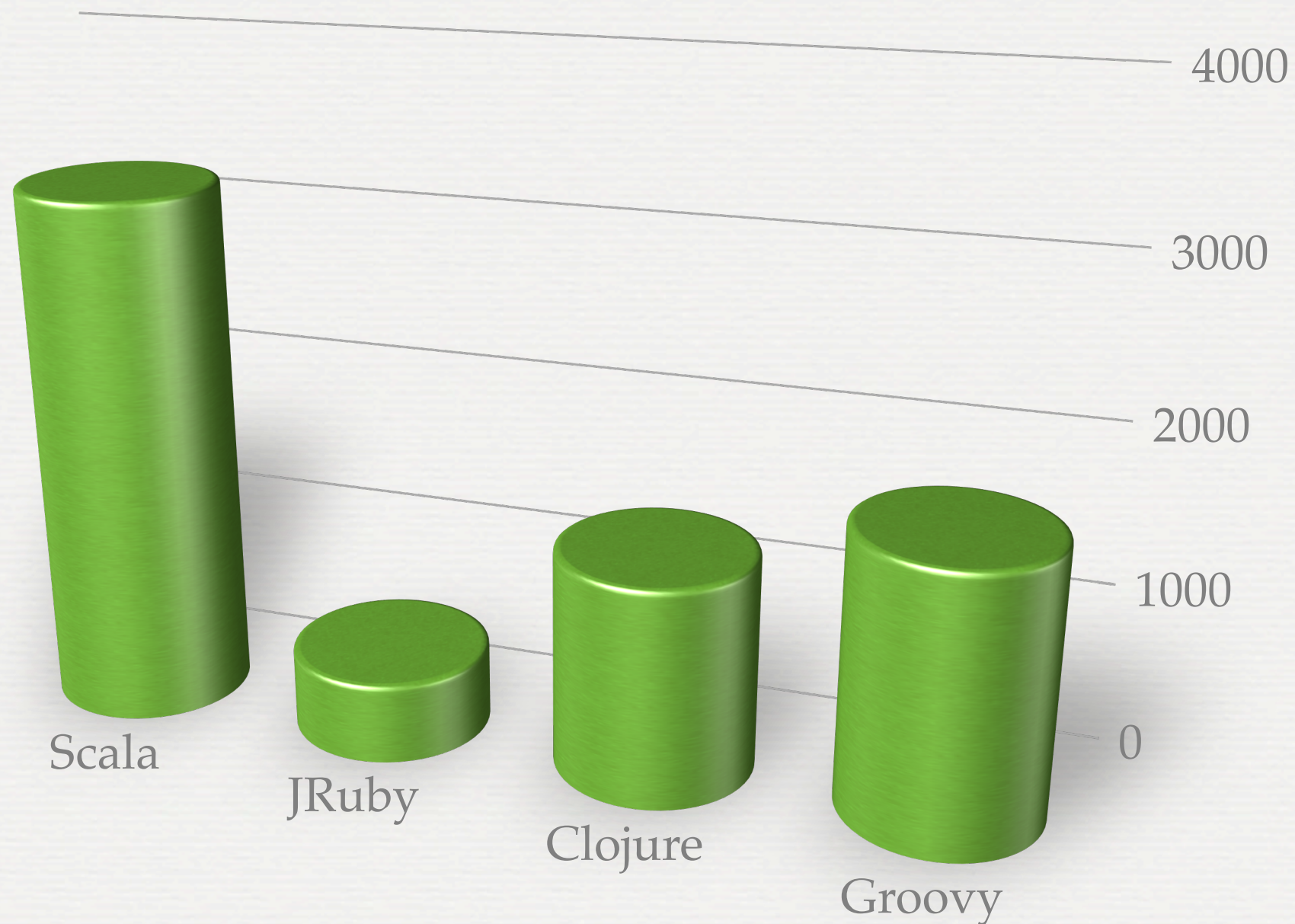
■ Tagged Questions (February 15, 2011)





# STACKOVERFLOW

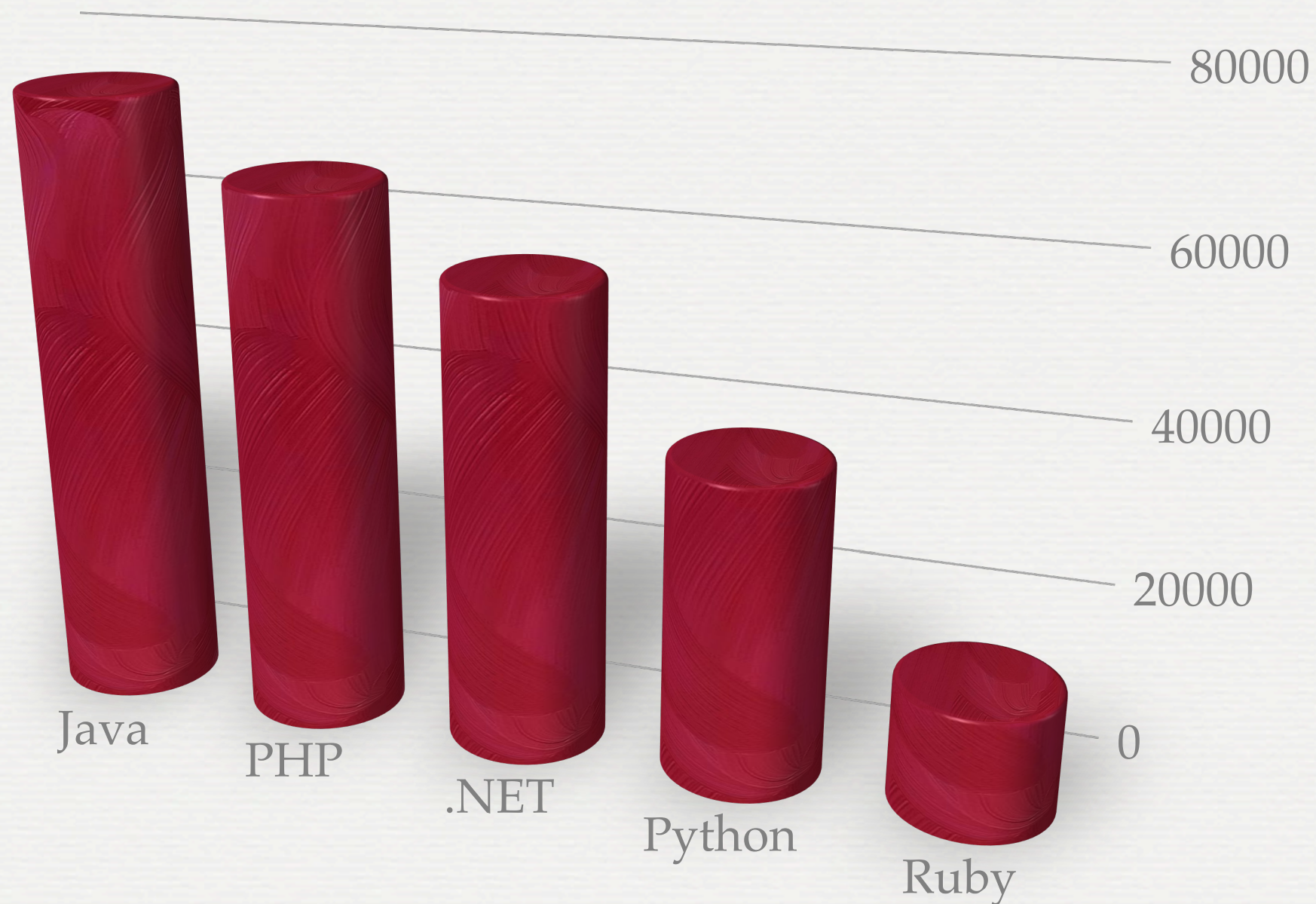
■ Tagged Questions (February 15, 2011)





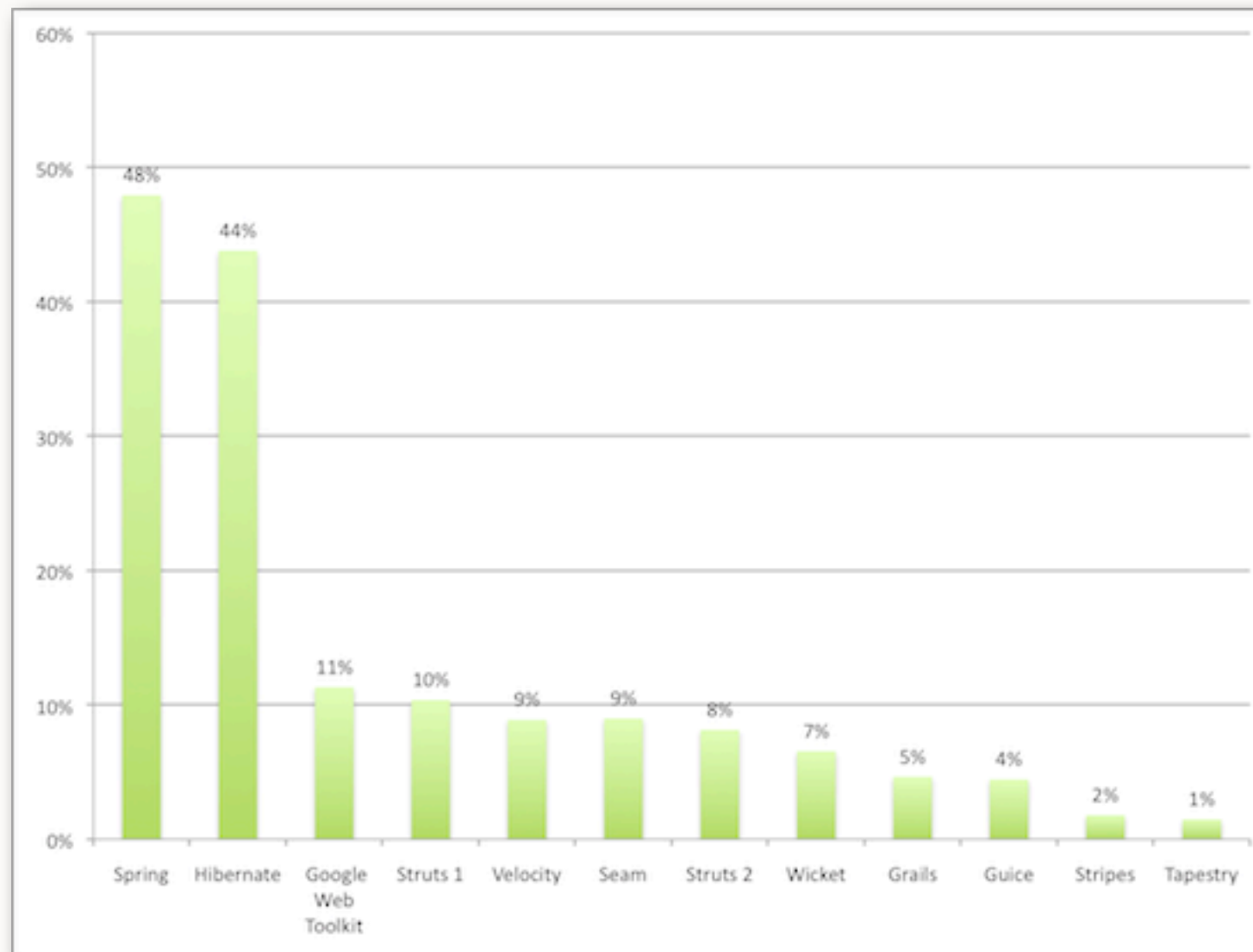
# STACKOVERFLOW

■ Tagged Questions (October 28, 2010)





## FRAMEWORK POPULARITY



Source: ZeroTurnaround's Java EE Productivity Report 2010





## CONCLUSION

*What if there is no “best” web framework?*

[http://www.gladwell.com/2004/2004\\_09\\_06\\_a\\_ketchup.html](http://www.gladwell.com/2004/2004_09_06_a_ketchup.html)



# DON'T LISTEN TO ME!





# CHOOSE YOUR OWN!

- Prioritize a list of features that are important to your application.
- Pick 3-4 frameworks and do a 1-week spike with each, developing the same application.
- Document and rank each framework against your list of features.
- Calculate and choose!

# QUESTIONS?

## Contact Information

<http://raibledesigns.com>

<http://twitter.com/mraible>

## Download Presentation

<http://slideshare.net/mraible>

