



# Gluing Things Together with Node.js

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TODD NUSSBAUM

DIRECTOR – JAVA PRACTICE

HMB, INC.

# First things first ...

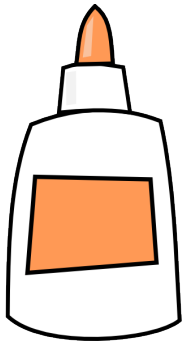
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## Todd

- Husband, father of 3
- Background in pure sciences, former teacher
- Information technology since 2000
- Coach youth sports with my sons

## HMB – *Bridging Business and Technology*

- Consulting services firm
- Columbus, OH & Louisville, KY
- Technology Solutions - Custom App Dev



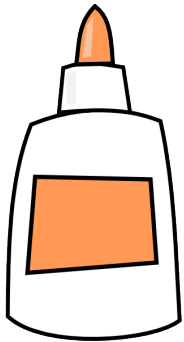
“We have this system ...”

*“Ok. No problem ...”*

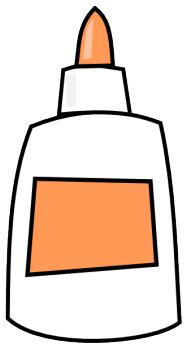
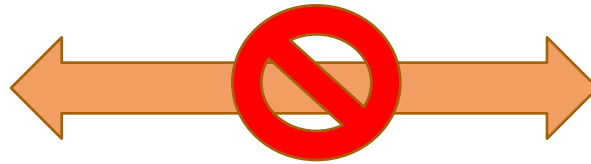
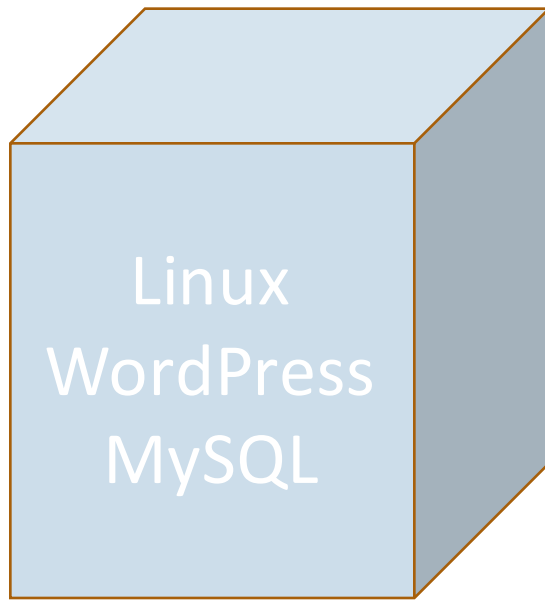
“CMS ...

Integration ...

WordPress ...”



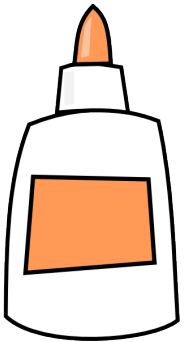
*“Uh ... ok ... zzzzzzz ...”*



# Day 1

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*So ... How are we  
going to build this  
thing?*



# Technologies

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Tiny Linux server on cloud platform

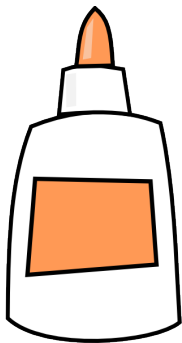
WordPress / MySQL

3<sup>rd</sup> party CMS system

- HR focused
- “Somewhat” REST API

Node.js

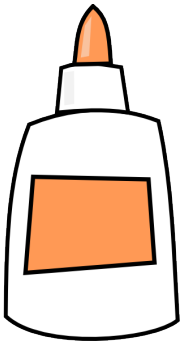
- Large user base with lots of libraries available
- Likely that a support person will know web technologies
- Easy to implement from the command line (cron, etc)



# Day 4

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*Hmm ... let's not  
over-complicate  
this*



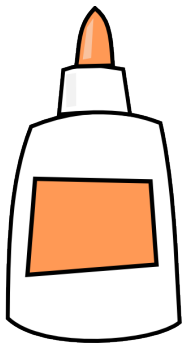
# Implementation

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Encapsulate external systems

Focus on simple synchronization processes

KISS – don't make it harder than it is





# Architecture

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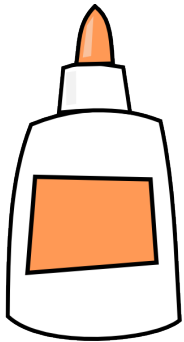
Employee list  
sync process

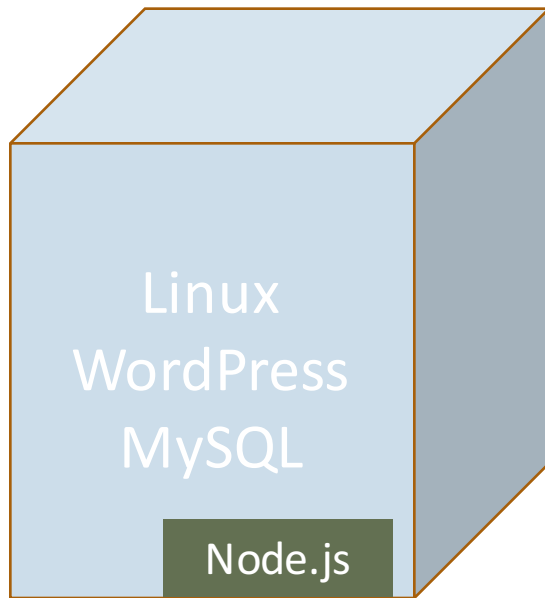
Job list  
sync process

Model classes  
(job, employer, etc)

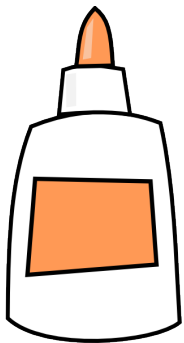
Service classes  
(CMS, WordPress)

Utility classes  
(logging, etc)





Jobs  
Employers



# Node.js components

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Node-xmlrpc – client library to connect with WordPress

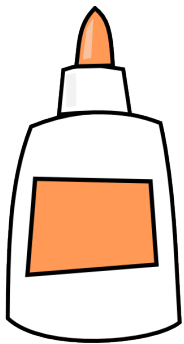
Node-rest-client – client library to connect with 3<sup>rd</sup> party CMS

Moment – library for working with dates

Winston – logging

Lodash – general utilities, mainly for arrays/collections work

Q – general promise library

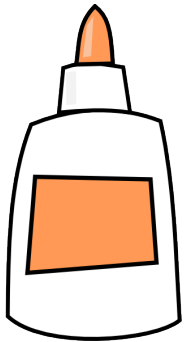


# Glue Trivia!

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What is the main ingredient in white school glue?

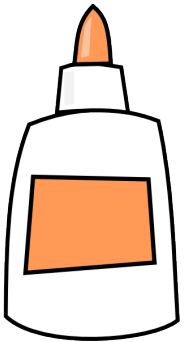
- A: Horse hooves
- B: Milk proteins
- C: Poly-vinyl-alcohol
- D: Rice flour and cane sugar



# Day 10

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Oh, and we need  
some other stuff ...



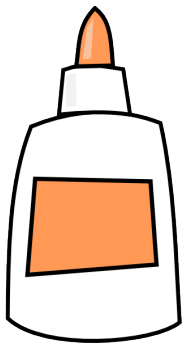
# Scope creep

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Part of every project, plan for it

- Change request – update your estimate
- Expandable architecture

New integrations with new WordPress plugins



# Architecture

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Employee list  
sync process

Job list  
sync process

New user  
creation process

New employer  
creation process

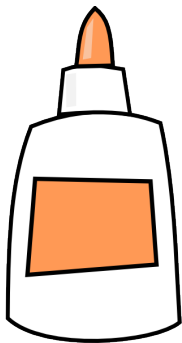
Model classes  
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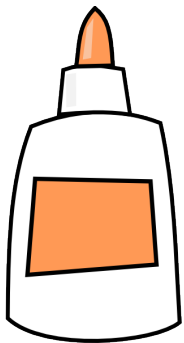
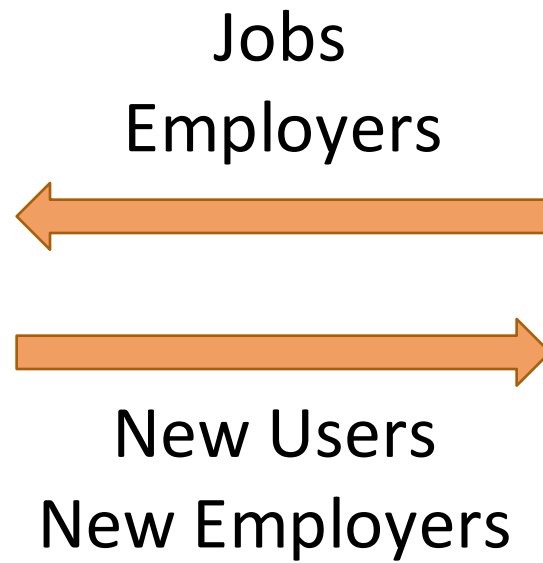
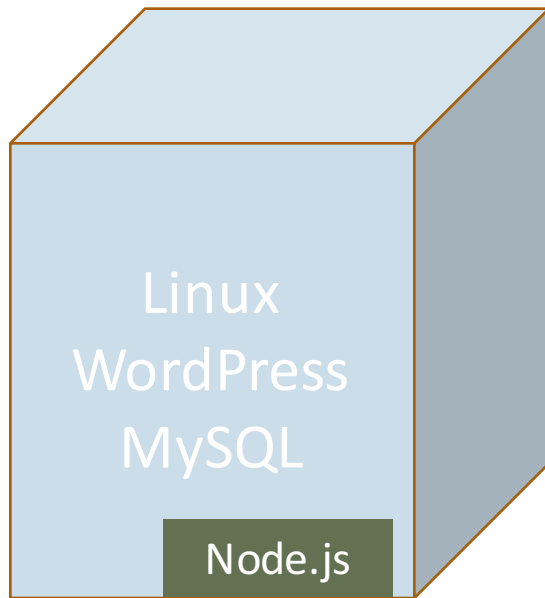
Service classes  
(CMS, WordPress,  
email, forms, etc)

Utility classes  
(logging, zip code  
mapping, location/term  
mapping, etc)

New forms &  
email  
functionality

Mapping  
utilities







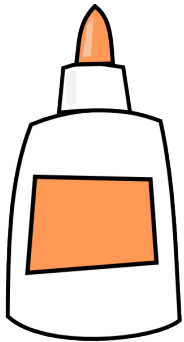
# Node.js components

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Crypto-js – used to build identification hash for plugin integration

Mailgun – library to simplify accessing Mailgun service

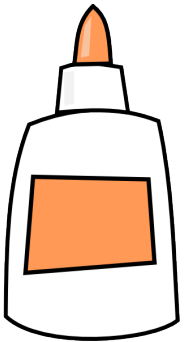
Built-in JSON functionality – used to store zip code and location/term mappings



# Day 17

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*Well, it worked fine  
yesterday on my  
machine ...*



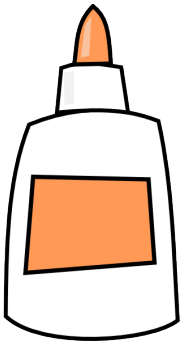
# Performance issues

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Depending on the project, this may become an issue

## Issues

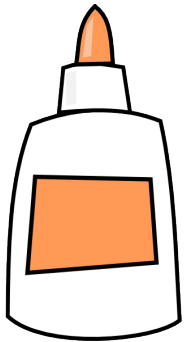
- WordPress query limit
- Tiny Linux server memory limit



# Node.js components

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Semaphore – library for simple semaphore behavior

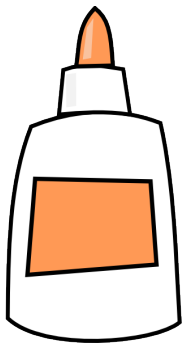


# Glue Trivia!

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Methylene diphenyl diisocyanate is the main ingredient in which type of glue?

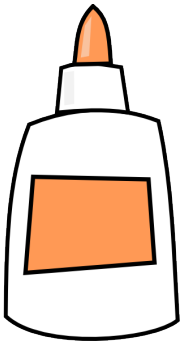
- A: Traditional model airplane glue
- B: Gorilla glue
- C: Hot glue gun glue
- D: PVC pipe glue



# Day 21

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*Wait – there are API limits?*



# Revised situation

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Additional performance issues

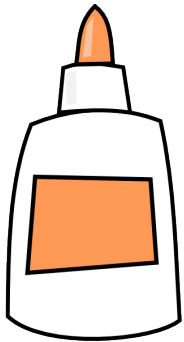
Not all APIs are documented well

Client may not realize impacts of changes on their end

Plan for this during estimation – call out assumptions

New issues

- Data volume
- 3<sup>rd</sup> party API daily call limits



# Approach

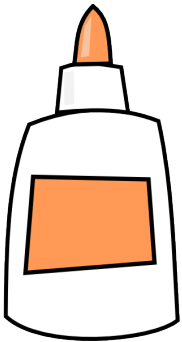
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Architecture remained the same

Script structure changed

- Store timestamps, and search based on last time updated

Multiple scripts – one for incremental, one for full day





# Final Architecture

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Employee  
incremental  
sync process

Employee  
full list  
sync process

Model classes  
(job, employer, etc)

Job  
incremental  
sync process

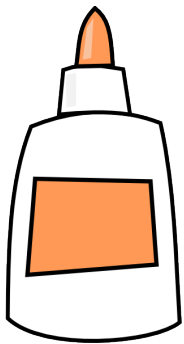
Job  
full list  
sync process

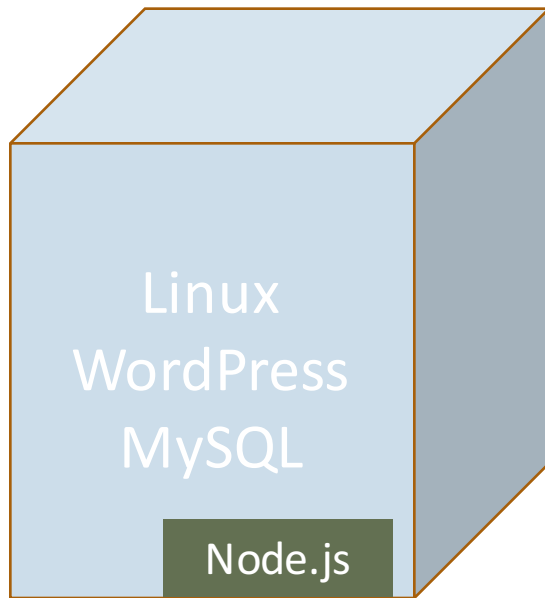
Service classes  
(CMS, WordPress,  
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New user  
creation process

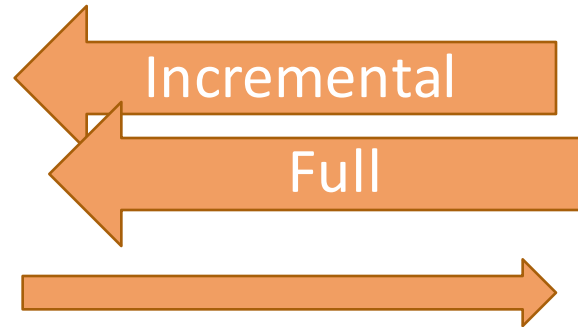
New employer  
creation process

Utility classes  
(logging, zip code  
mapping, location/term  
mapping, etc)

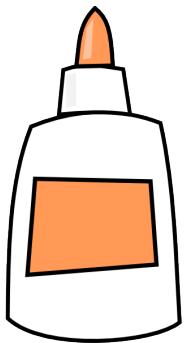




Jobs  
Employers



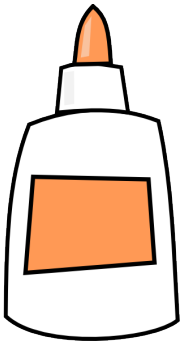
New Users  
New Employers



# Day 30

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*Everyone has their  
fingers crossed, right?*

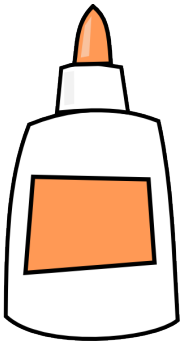


# Deployment

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Integration components – no Node.js issues

WordPress – lots of undocumented cases for plugins, version mismatches, etc.

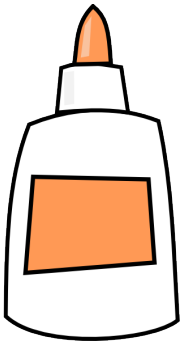


# Glue Trivia!

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In the early 2000s, GLUE was a Java library for XML and web service integration. The organization that created it was called:

- A: BEA
- B: Apache Commons
- C: The Mind Electric
- D: XMLMethods



# Lessons Learned

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Plan for changes

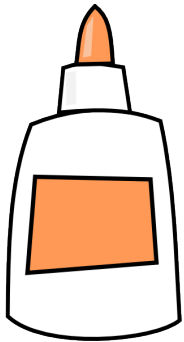
Node.js is quite fast for working with HTTP-based APIs

Postman is very handy for working with HTTP APIs

Should have used NPM for organizing and launching scripts

Use a build tool, even for small projects

Consider timer based tasks in Node, skip cron



# Summary

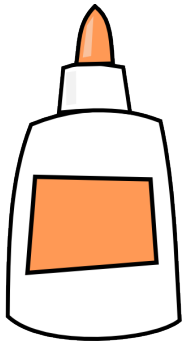
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Consider Node.js for “other” computing tasks

- Not just a server-side web platform

Works well as an integration tool, especially when integrating HTTP based services

Node.js ecosystem is vast, and has already solved lots of common problems



# Glue Trivia!

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School white glue?

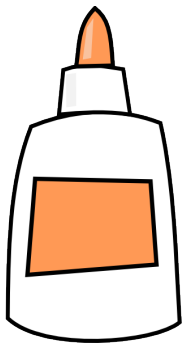
- Poly-vinyl-alcohol

Methylene diphenyl diisocyanate?

- Gorilla glue

GLUE XML library?

- The Mind Electric (acquired by webMethods, now defunct)





# Resources

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node-xmlrpc - <https://github.com/baalexander/node-xmlrpc>

node-rest-client - <https://github.com/aacerox/node-rest-client>

Moment - <http://momentjs.com>

Winston – <https://github.com/winstonjs/winston>

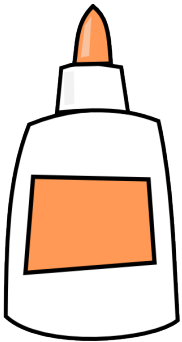
Lodash – <http://lodash.com>

Q – <https://github.com/krisKowal/q>

Crypto-js - <https://github.com/brix/crypto-js>

Semaphore - <https://github.com/abrkn/semaphore.js>

Postman - <http://www.getpostman.com>



# Thank you

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[HTTP://TNUSSBAUM.GITHUB.IO](http://tnussbaum.github.io)

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