

# codestock

## Transforming Tribal Knowledge into Learning Trees

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1

That song that I just played is called "Begrüßung", which means "Welcome" in German. [▶](#)

It is typically played at the beginning of a hunt to welcome all hunters.

We welcome you today to our Hunt for better ways to share localized knowledge within our work teams.

Speaking of hunts, recently I found myself deep in a forest, surrounded by a family of squirrels called a "scurry".

As I looked up at all the trees I realized that ...



Squirrels are some of the best accidental developers in the world.  
Squirrels develop forests!  
If only they could remember where they put their building materials ...

As this little guy chewed on my boots he told me his story about  
Squirrel Works.

I think there are a few things that we all might learn from him ...



Things were chaotic at Squirrel Works!  
The developers scrambled furiously to deliver their next products.  
Many shook their heads and tails wondering how they'd ever meet their schedules.

As at SquirrelWorks, the most expensive part of our software development is the cost of developers!  
Often enough, little is invested in helping us learn all the proprietary things we need to be productive.

As a result we too feel the crunch to deliver.





The developing forest had changed as a result of downsizing seasoned squirrels. As its inhabitants rebuilt, there was fierce competition for scarce resources. The owners of the forest expected business to go on as usual.

Have you ever been frustrated arriving into such a team? AUD  
You worked hard to keep up. But the rapidly changing systems and need to absorb tribal knowledge slowed your momentum.

Perhaps you also were motivated to hunt for better ways to learn.



Despite this, there was much anticipation in the Squirrel Works scurry.

Poppy was busy finishing up a new RESTful interface  
but excited and anxious as he awaited the news ...



It's a Squirrel! What a proud Poppy!

New kits were born several times a year.  
Each time, the scurry was unprepared!


Like Baby kits, new developers on our teams are somewhat innocent, impressionable, and will grab whatever info they can!

... and we never know when they will arrive!



Zippy, like all new kits, relied heavily on the scurry for care and feeding. He consumed the already scarce acorns at a rapid pace.

This was a big time drain on the older squirrels, Especially considering that there were more kits to come with each litter.

As Zippy grew  he became a bit more self-reliant. It wouldn't be too long before Zippy would be expected to follow in Poppy's footsteps @ Squirrelworks.

## Information Nuggets



1 Zippy soon learned that Acorns were more than just food.  
Acorns are powerful nuggets of information.



They can be an immediate snack or planted to grow  
strong trees that produce even more acorns.

In the same way, our development knowledge can be planted  
And grown into learning homes, which produce abundant  
Acorns to feed the squirrelliest of developers.



Squirrel's teeth never stop growing.  
They must cut their teeth on acorns to stay healthy.

Like developers, by nature Squirrels are constantly craving  
something to cut their teeth on or they'll go crazy!

As developers, cutting our teeth helps us to master our craft and be self-reliant!



Some things are well known by all scurries,  
but as Zippy grows and asks questions specific to his world...  
He discovers that these acorns aren't so easy to find!

Developers need similar acorns of knowledge to do their work.  
Sometimes, like Zippy, we don't know whom to ask for help.

AUDIENCE: Curious, what kinds of acorns are you typically looking for in your own forest?

I've been on hunts for:

- How things work in the application domain ...
- Elusive architecture diagrams
- Coding standards,
- release steps,

the list goes on.





Zippy watched the older squirrels  
bury their acorns in all kinds of strange places.

Their intentions were good in storing them ...  
but these places aren't conducive to their purpose!

AUDIENCE: Which places are your teams using to store information?

- email,
- SharePoint
- Google Drive
- Jive,
- Wikis How are those working out for you?





1 How long do you think it takes Zippy to find his Acorn answer here?  
I'll save you and Zippy some time. ▶  
Zippy hunted for acorns in Email, which tended to be  
a popular Squirrel way of sharing knowledge.

How many times have you received an email containing an answer,  
yet don't remember where you put it?

How many times were you *sure* you sent an answer to someone else,  
yet couldn't find it when they ask about it?

Zippy realized how quickly these answers became obsolete as well...



1 One day Zippy spent an hour hunting for an acorn.

When he found one, he spent another 30 minutes cracking it open...only to find a nasty weevil!

Acorn weevils burrow into acorns and eat the insides.



There wasn't anything useful left.

This actually happened to him a lot...wasting his time and energy.

Time and constant environment changes eat away at information like a weevil.

## Hands off my nuts!



Frustrated, Zippy thought he'd ask other squirrels for help.  
Zippy's first search for help in getting acorns was unfortunate.

He quickly found some squirrels will fight to death over their territory.  
Zippy was scared to approach these guys and  
could never take advantage of any useful acorns they might have.



Know any squirrels with big heads?

Zippy found some squirrels who only shared if it improved their prowess amongst the others.

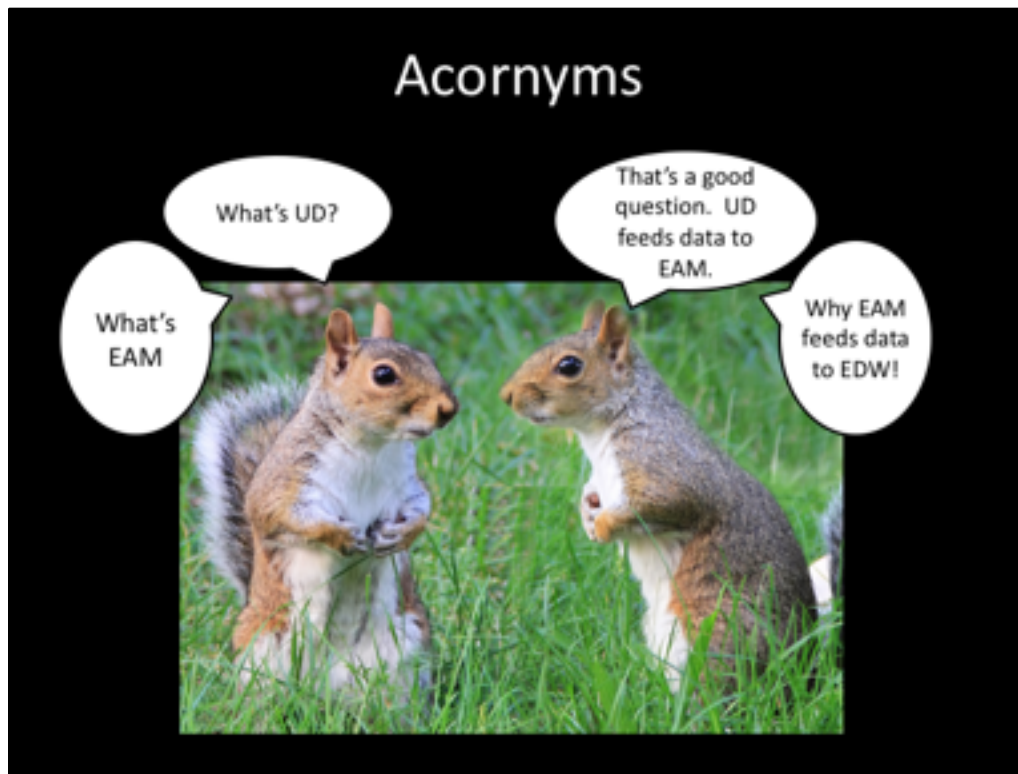
Unfortunately they don't realize that sharing their prized acorns with EVERYONE would greatly boost their standing!

.



1  
Finally Zippy went to seek the most senior squirrel,  
but she was always too busy and hard to find ▶  
Even when she was actually available.





4

Sometimes Zippy got answers that didn't help him at all.



Internal Acornyms... jargon... shop talk.

These are technically acorns worth keeping...  
but they're disguised in terms that not everyone understands...  
especially baby squirrels!



After almost seeing his mentor  
in a close call with a Lamborghini ....

Zippy was amazed at how much the scurry relied  
on these methods of sharing acorns.



Every squirrel needs to feel competent.  
Zippy was no exception.  
Sometimes the gap between here and there seemed impossible.

The gap b/w what you know and what you need to know is too wide.  
It feels like you never will be able to get to the other side...

A squirrel (or developer) shouldn't have to fill the gap with themselves.





Zippy felt left out in a desert of incompetence and waste with no water or acorns to sustain himself.

Small efforts felt momentous.  
His work was more expensive.

It took longer to finish because  
he spent so much time and energy  
looking for what he needed.

Somebody help!!



Frustrated, Zippy wanted to find a better way...  
he wanted to help and make things easier for his scurry.

He decided to take a walk to  
clear his head and think about things.

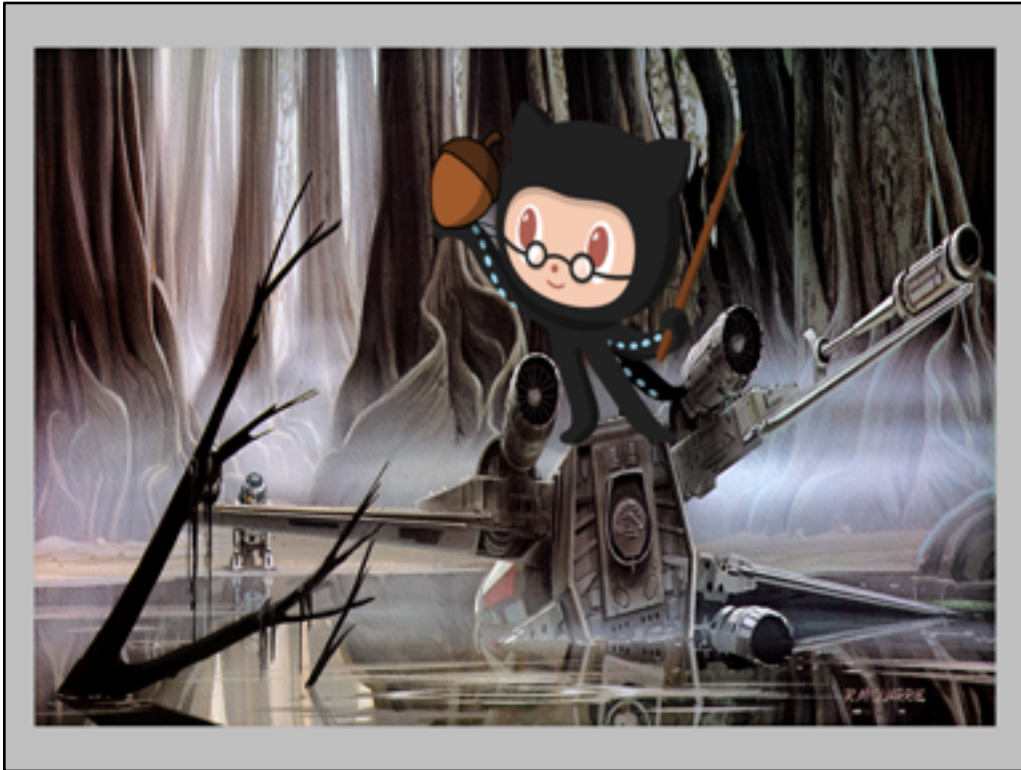


On his walk, Zippy met a Contractor squirrel named Rocky who was from a faraway scurry.

As they talked about where they were from, Zippy confided his troubles to his new friend.

Rocky was very excited to tell Zippy that they once had the same problems, but not anymore!

“Come with me” Rocky said,  
“I want to introduce you to someone!”



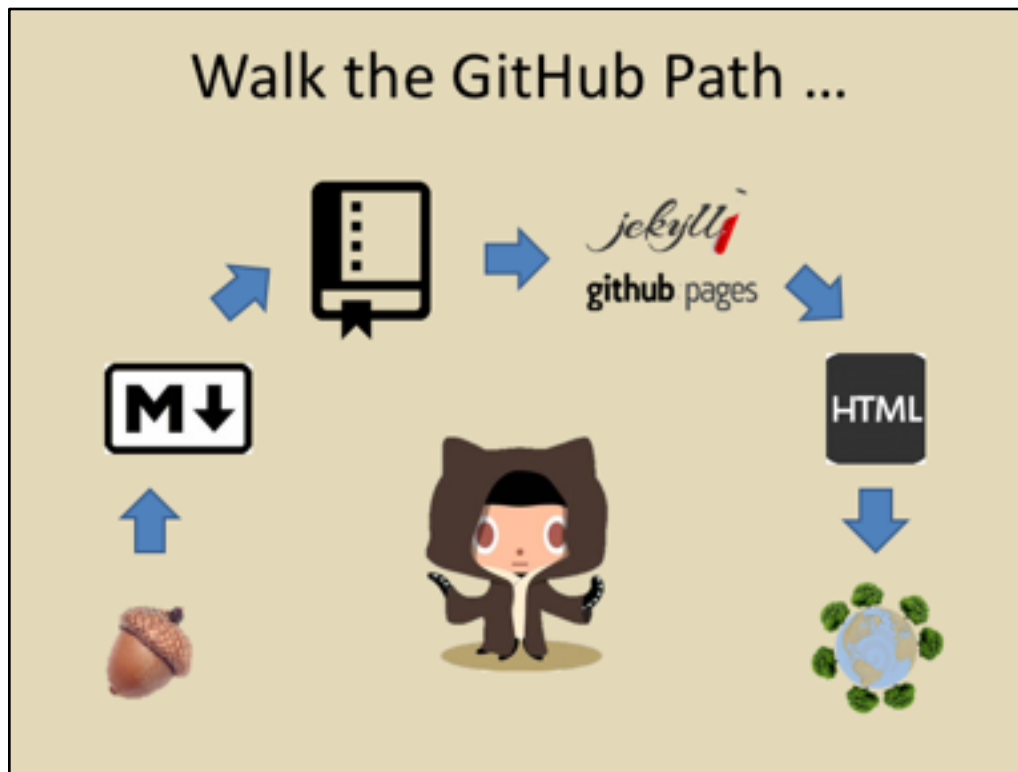
Rocky introduced Zippy to Octocat.

Octocat taught him about a better way to store and manage acorn answers.

AUDIENCE: does anyone know this cat?

Ah yes then you might know some of our story

But you might also know him SWITCH as "OctobiWanCatnobi".



6

“Zippy, You need to follow the path to GitHub. ▶

GitHub provides a place to store and manage acorn content using the same process which humans use for building software.

By creating ▶ content using the lightweight ▶ Markdown language and storing it in a ▶ Repository,

▶ Jekyll transforms these Answer Acorns into  
 an ▶ html forest  
 of ▶ beautiful learning trees





2

Zippy: The GitHub Path?

“Yes Zippy, You need to follow the path to GitHub.

I have an easy way for you to remember:

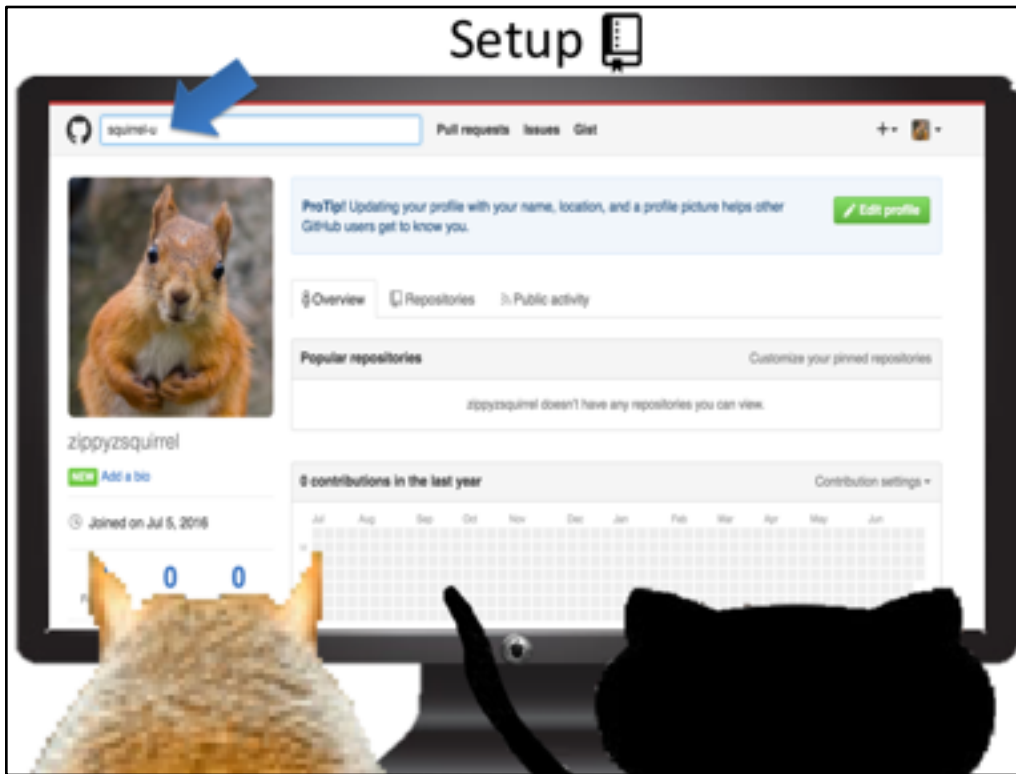
If you do these things you and your teams will  be more  PRODUCTIVE!

Zippy follow me closely as we begin our journey.



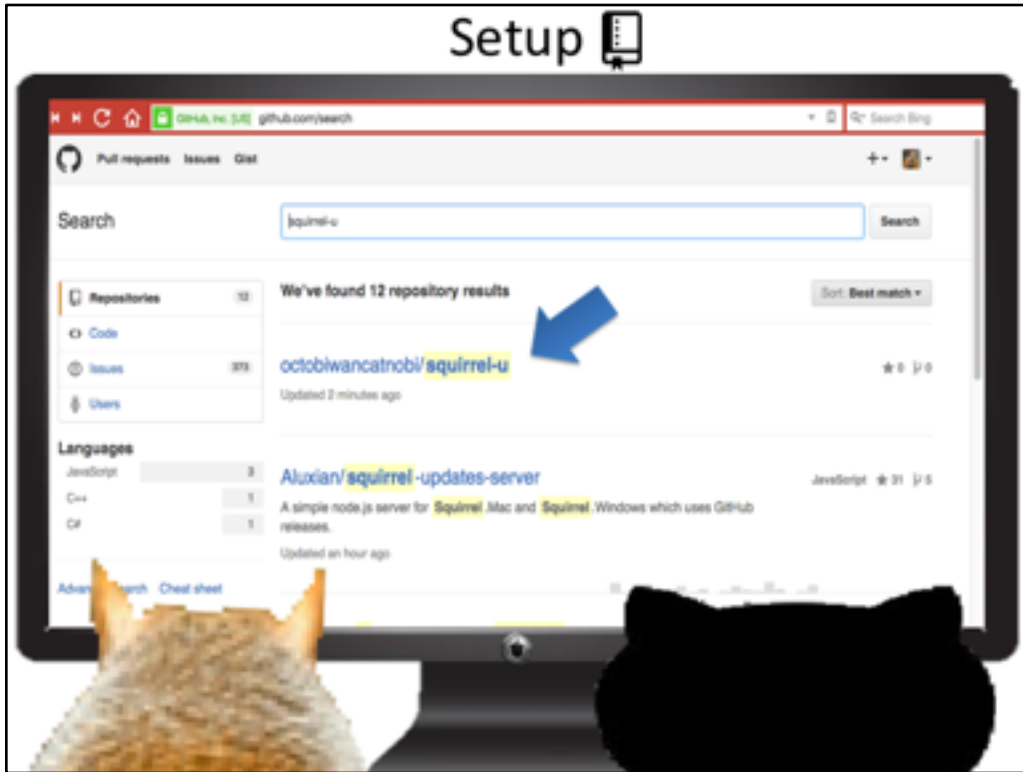
“To start down the path, lets get setup.  
Go ahead and signup for a free GitHub.com account.

Welcome to GitHub!”

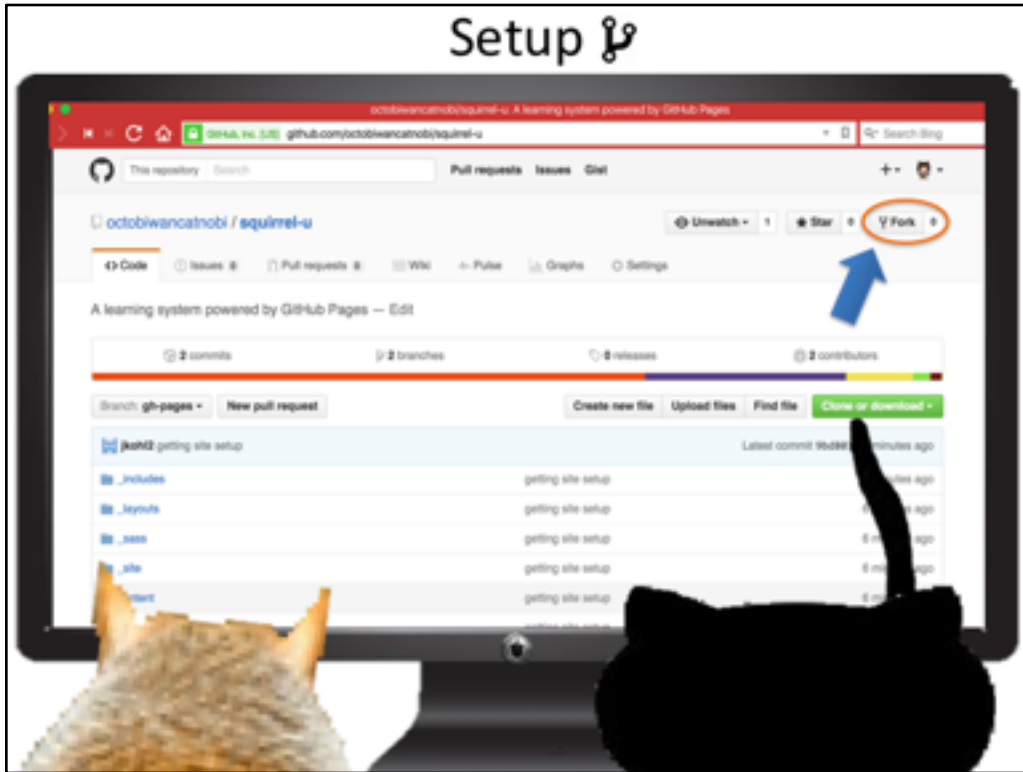


“Use search to find Octocat’s Squirrel U repository.”

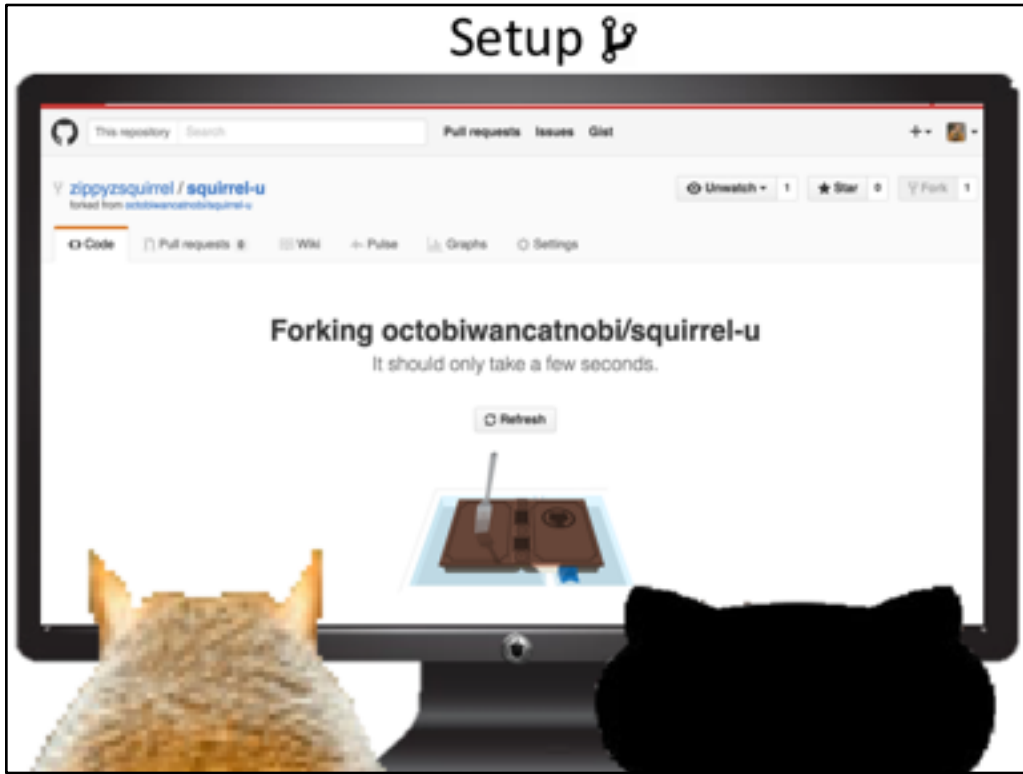




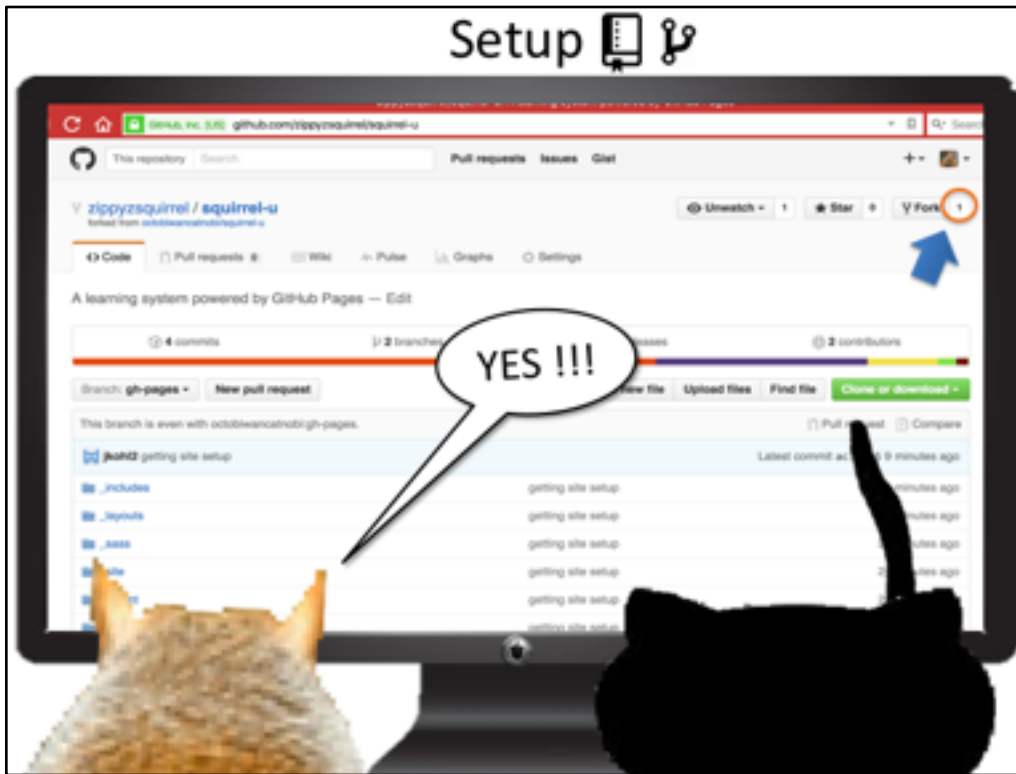
Here is the one repository which you need!



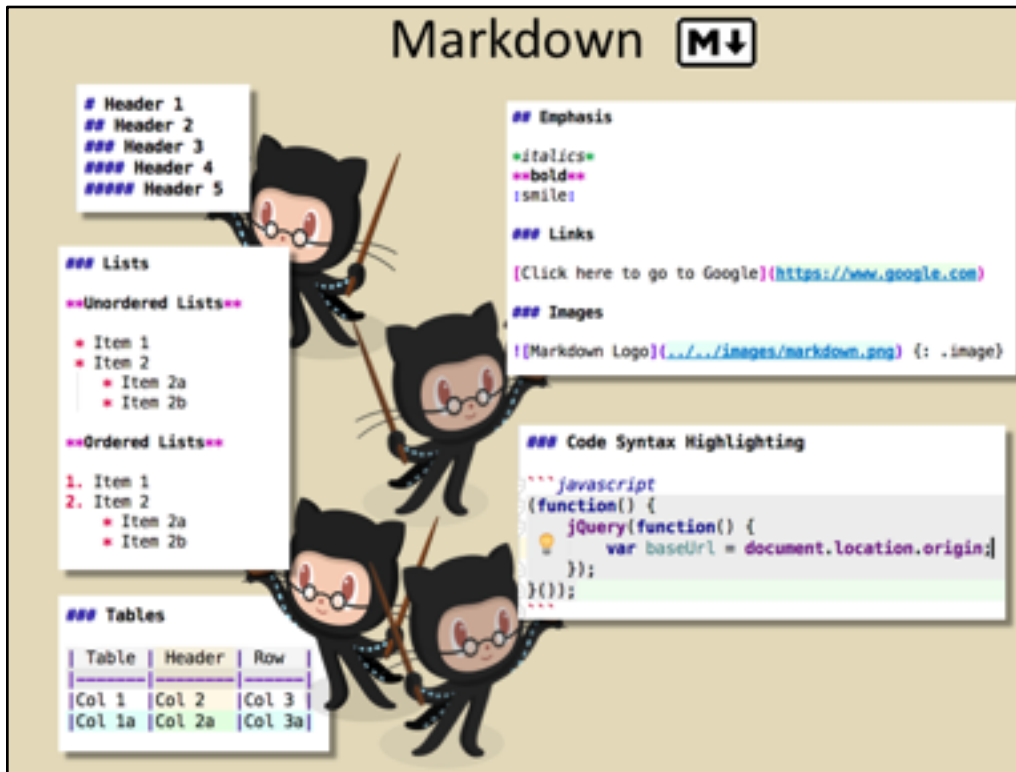
Now make your own copy of it by clicking the Fork button.



Zippy thought it was very exciting to watch his own Fork be created!



.... And now Zippy has his own Forked Copy!



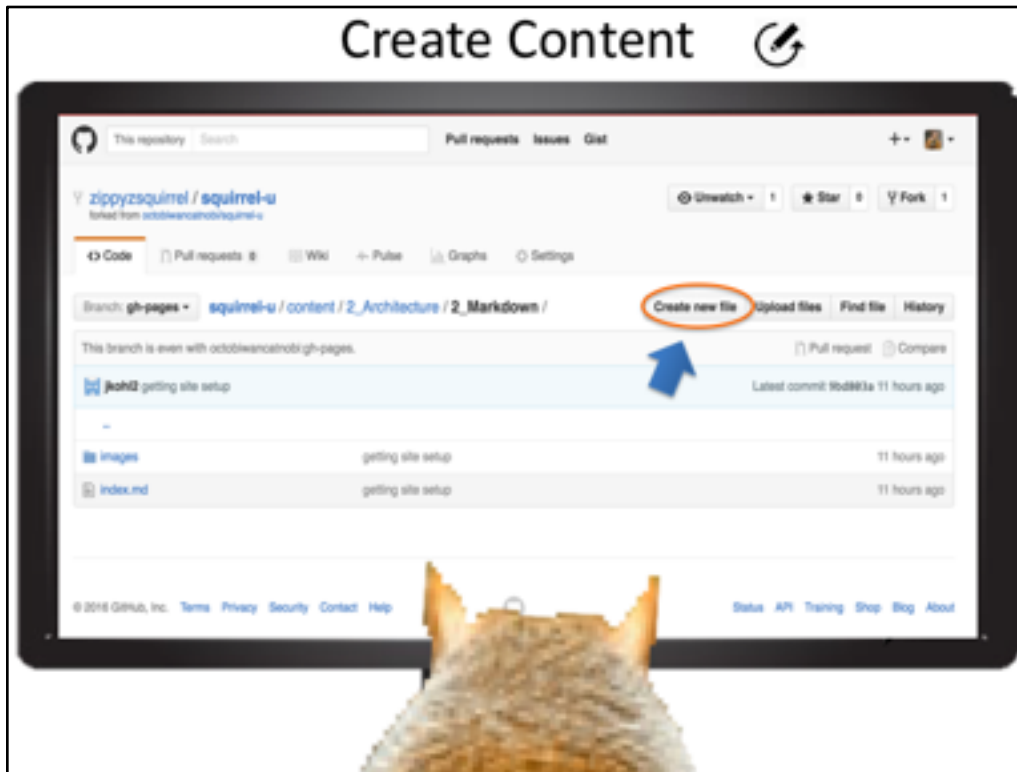
4 Markdown provides a simple way to create content without having to mess with html:

**for structuring content:**

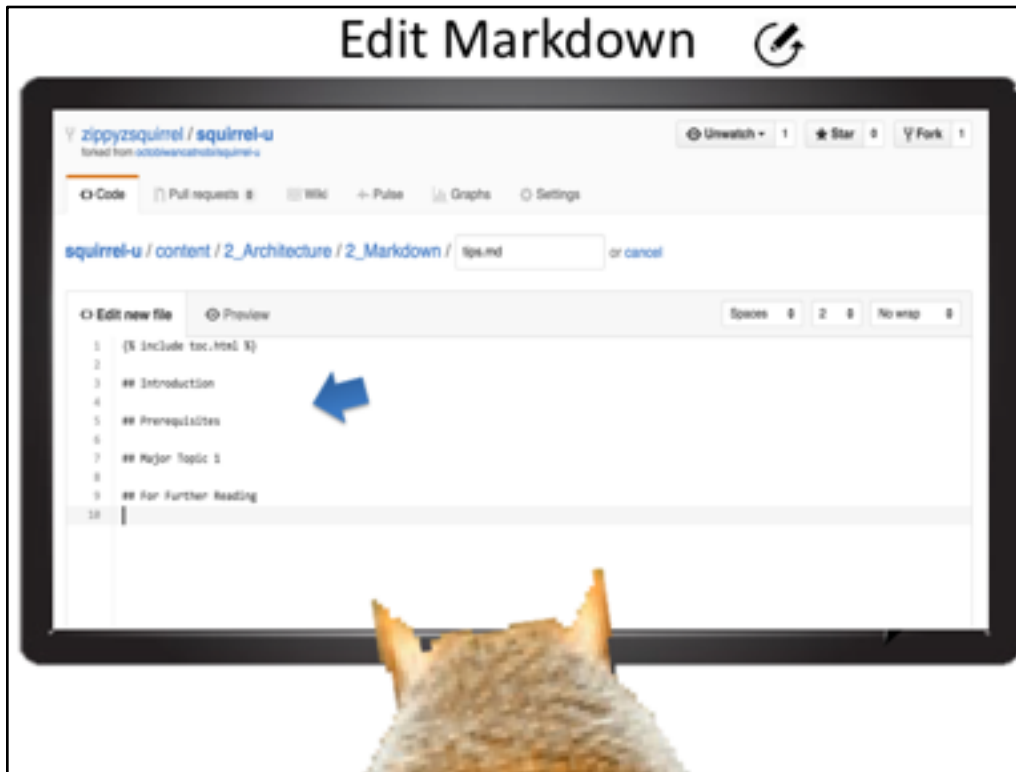
- ▶ like Headers, which can be used to build a TOC
- ▶ Lists
- ▶ Tables

**for Basics –**

- ▶ Bold, Italics, Underline, Strikethrough, emojis
- ▶ Links and Images
- ▶ **Syntax Highlighting for presenting source code**



Zippy started by creating a Markdown file from scratch.

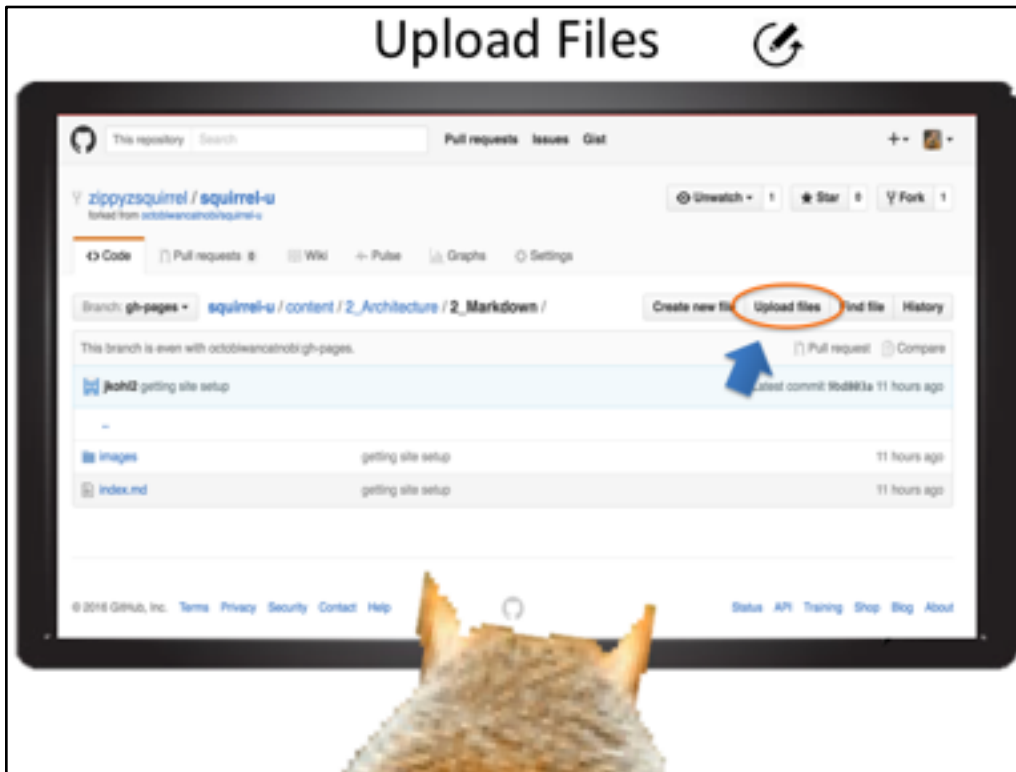


Next he created content using this basic Markdown Standard template.

The template has basics like:

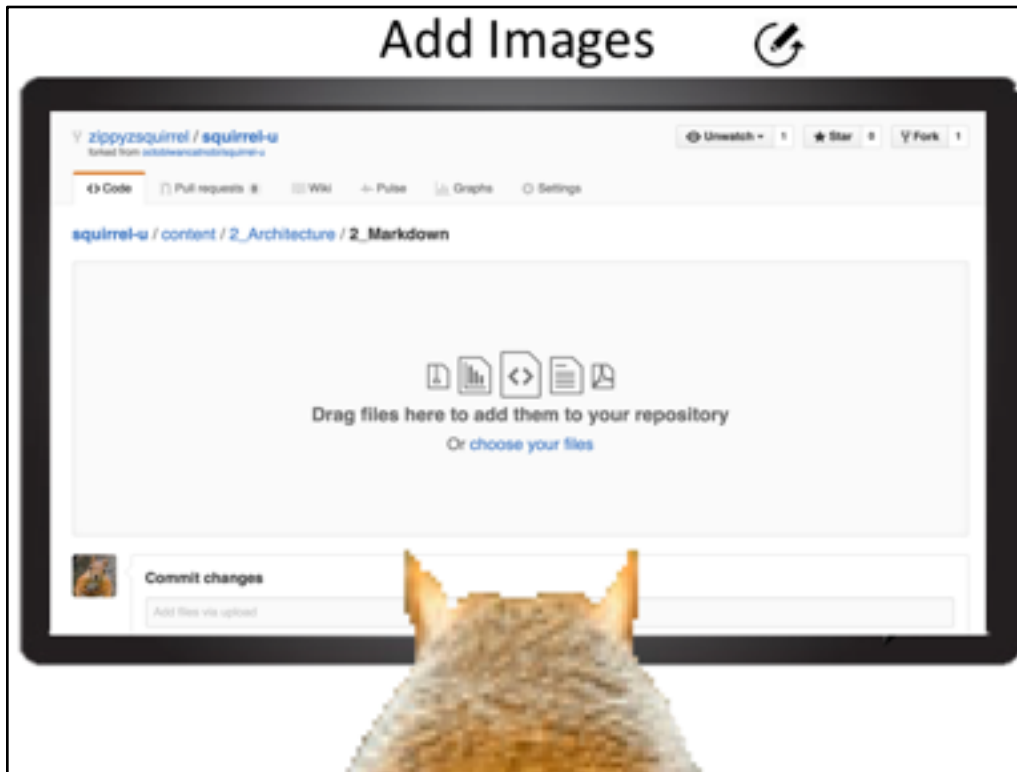
Table of Contents, Prerequisites,  
Introduction, Body and Further Reading sections.

If everyone uses this template,  
you can be sure that all acorns will look consistent in your Squirrel U.

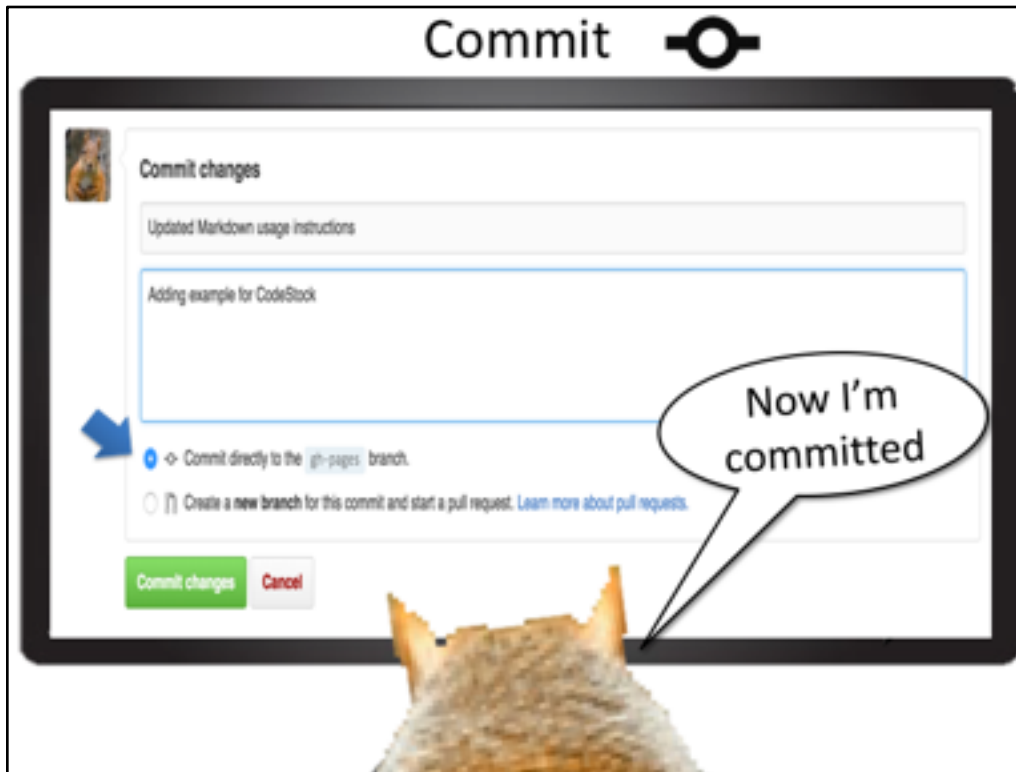


To add images to his pages, he used Upload Files.





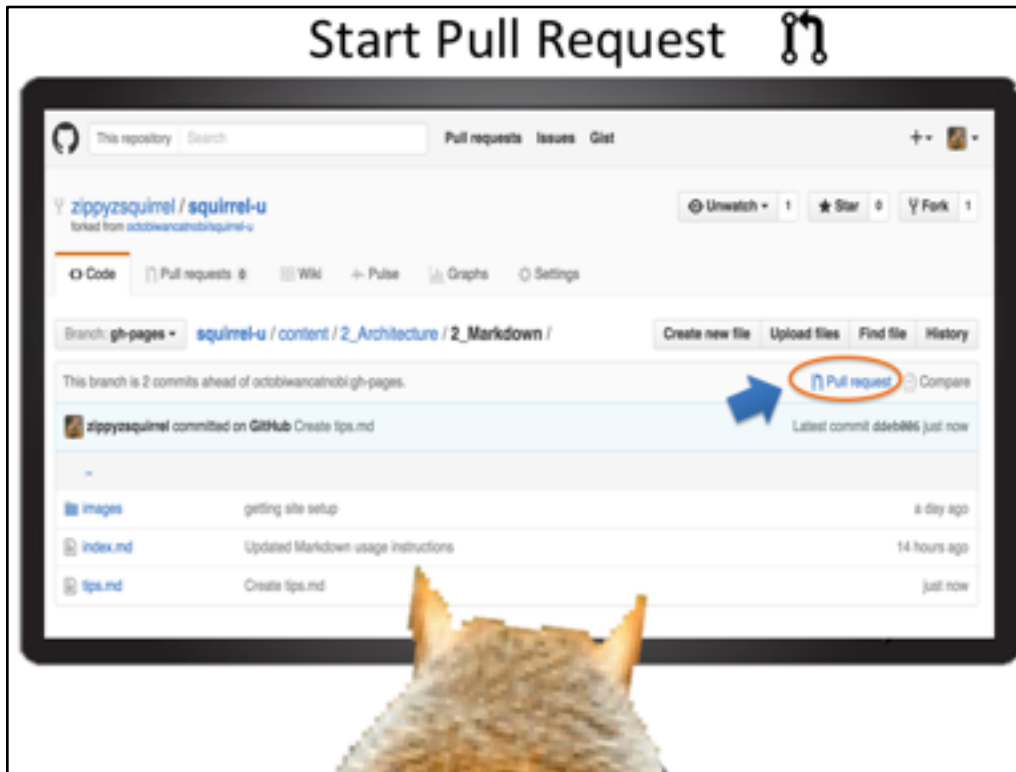
Then he dragged his images onto the window.  
He could then use Markdown to add these images to his page.



1 Once Zippy added his Markdown files and images, It was time for him to Commit them to GitHub.

He selected the  gh-pages branch ...

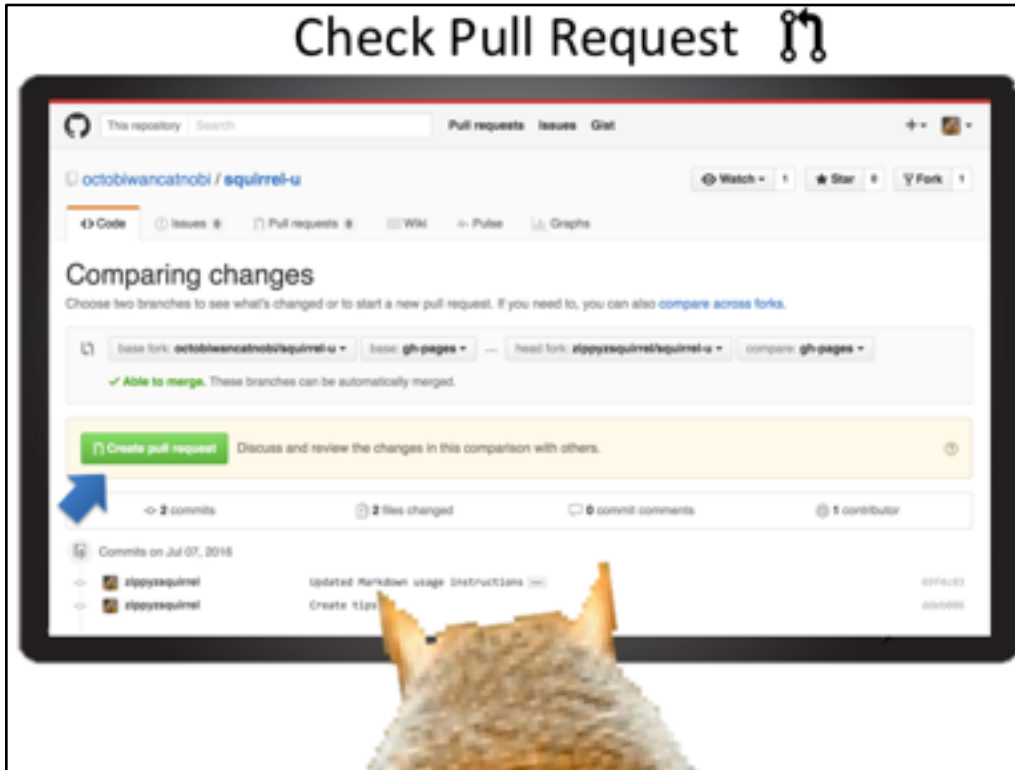
... and pressed the big green button.



To get his changes into Octocat's Repository, Zippy created a Pull Request.

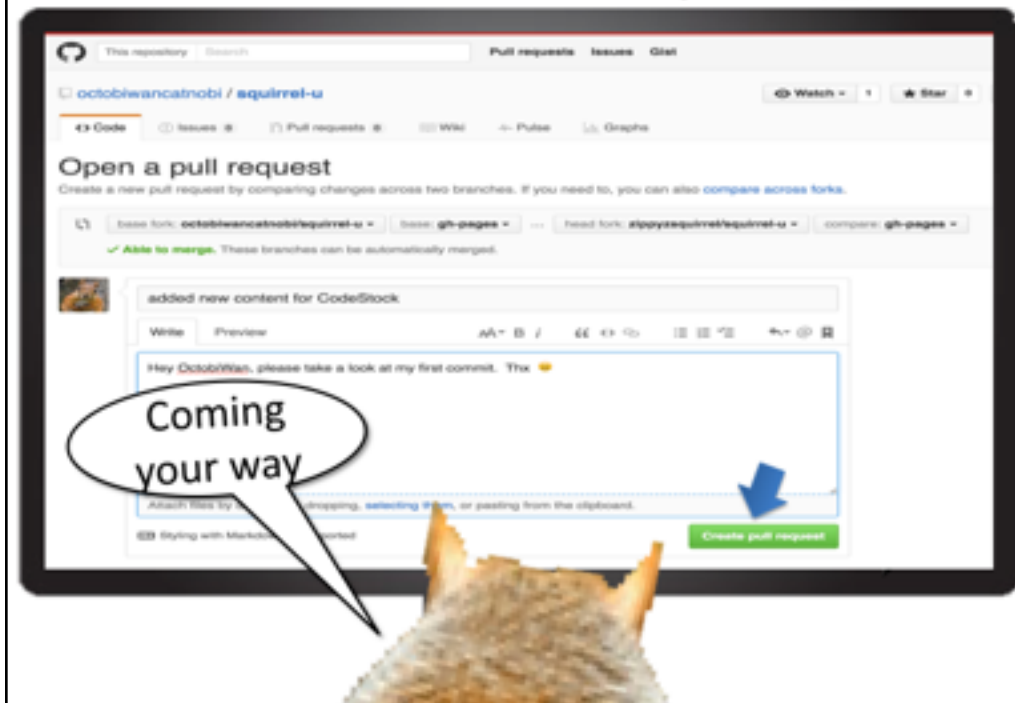
Octocat could then look at Zippy's work and decide if it should be added into his repository.

# Check Pull Request




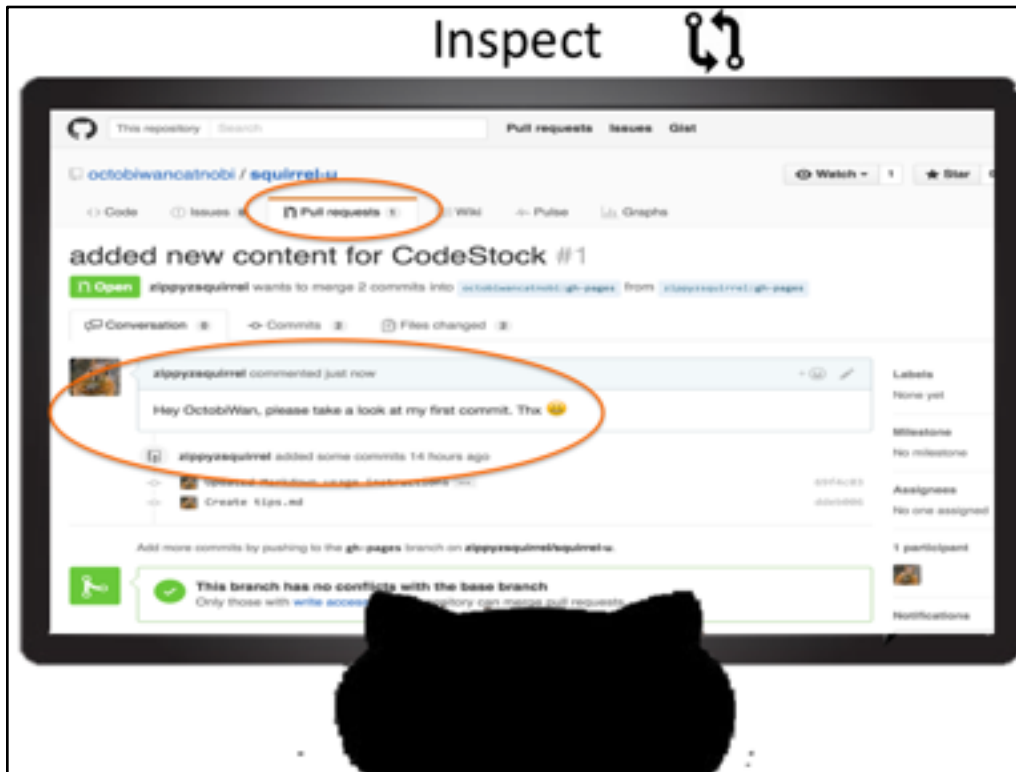
Zippy saw that there were no conflicts and he's ready to create his Pull Request. Since all was well, he saw a big green button and Clicked it.


# Document Pull Request




- 1 It is helpful to provide a good title and description for what has changed to your Pull Requests. You can even throw in some pictures if that helps!

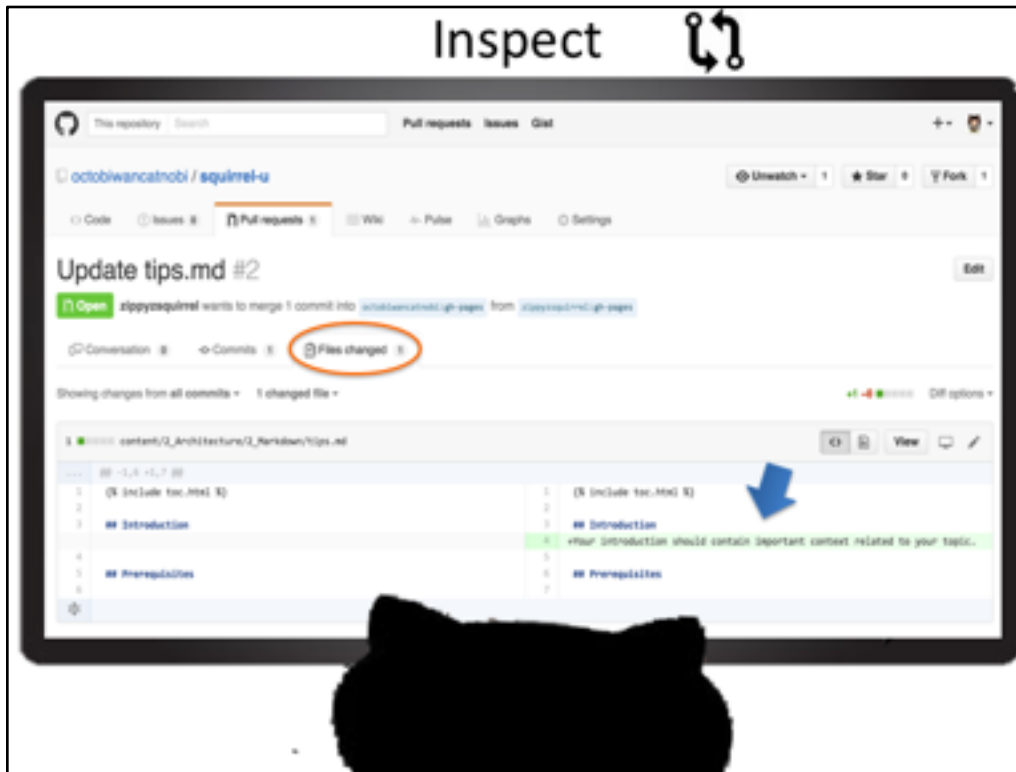
When you are ready,  click the big Green button!





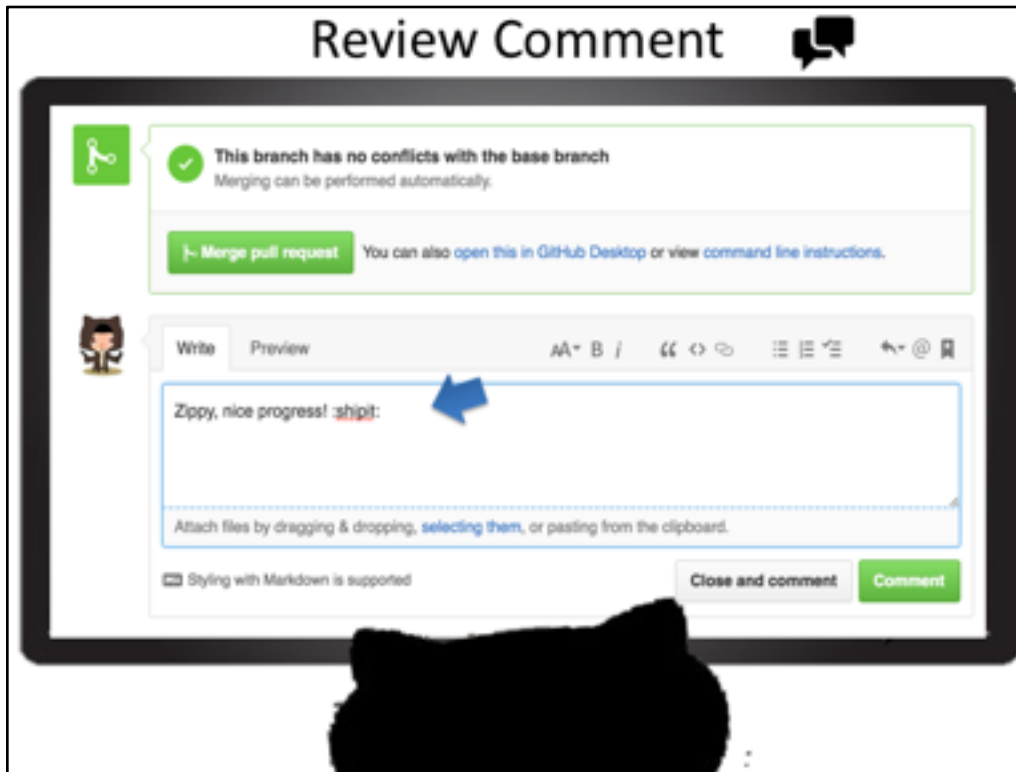
2 Now Octocat is looking at  his Pull Requests to find Zippy's.


Looks like he's got one Pull Request ...

Next Octocat looks at  the conversation which Zippy started ...



2 Before Octocat can merge, he needs to see what Zippy has changed.  
By going to see the  Files that have Changed,  
 Octocat can see any differences  
between the base files and what is in the PR.

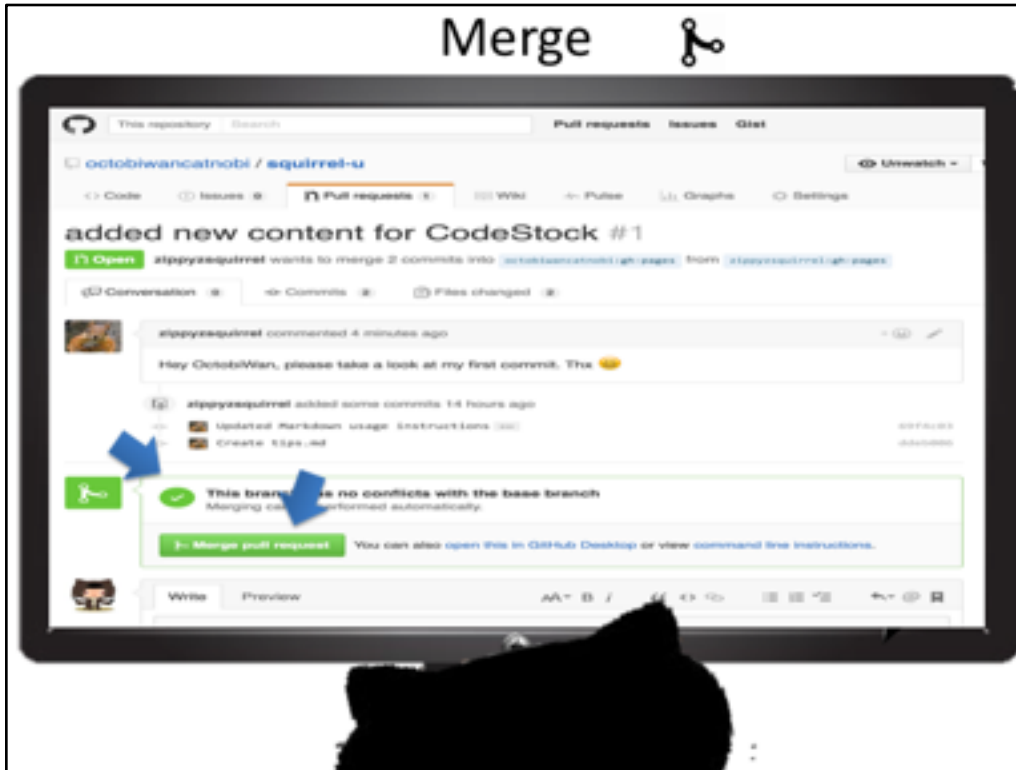


1 Octocat can also add  comments to any change, especially when he sees a change that he doesn't like.

Then the submitter can fix it, and he can inspect it again.

...this workflow makes it easy to collaborate on changes.

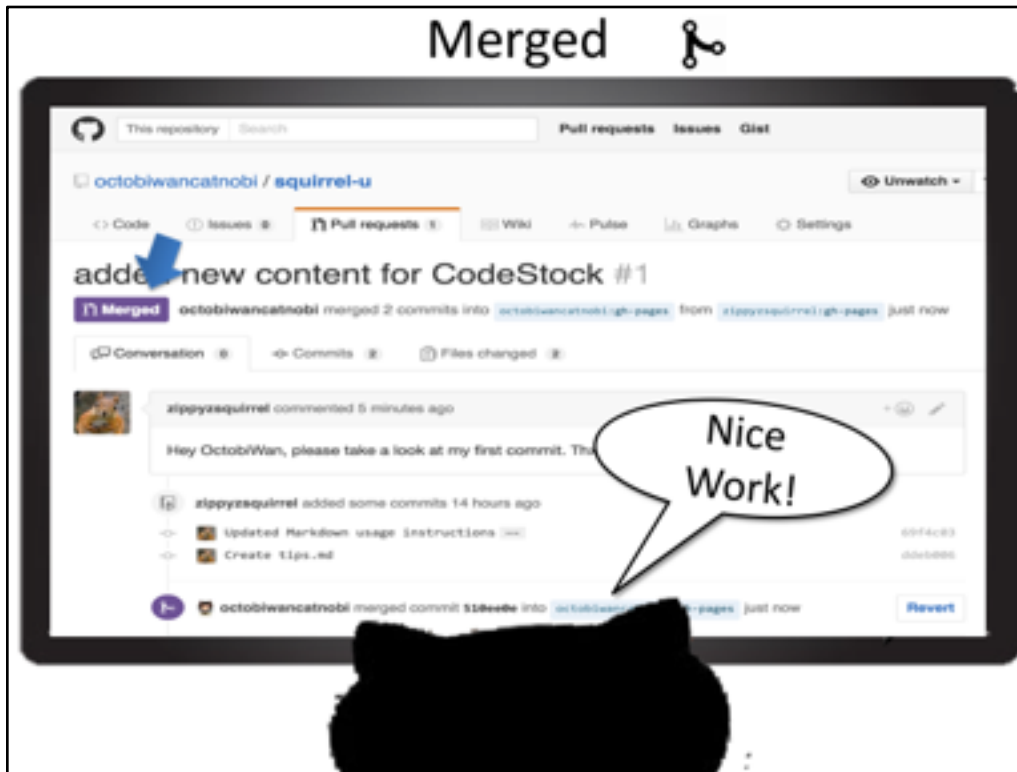




2 GitHub is showing that Octocat that it is safe to merge the PR into the Repository.

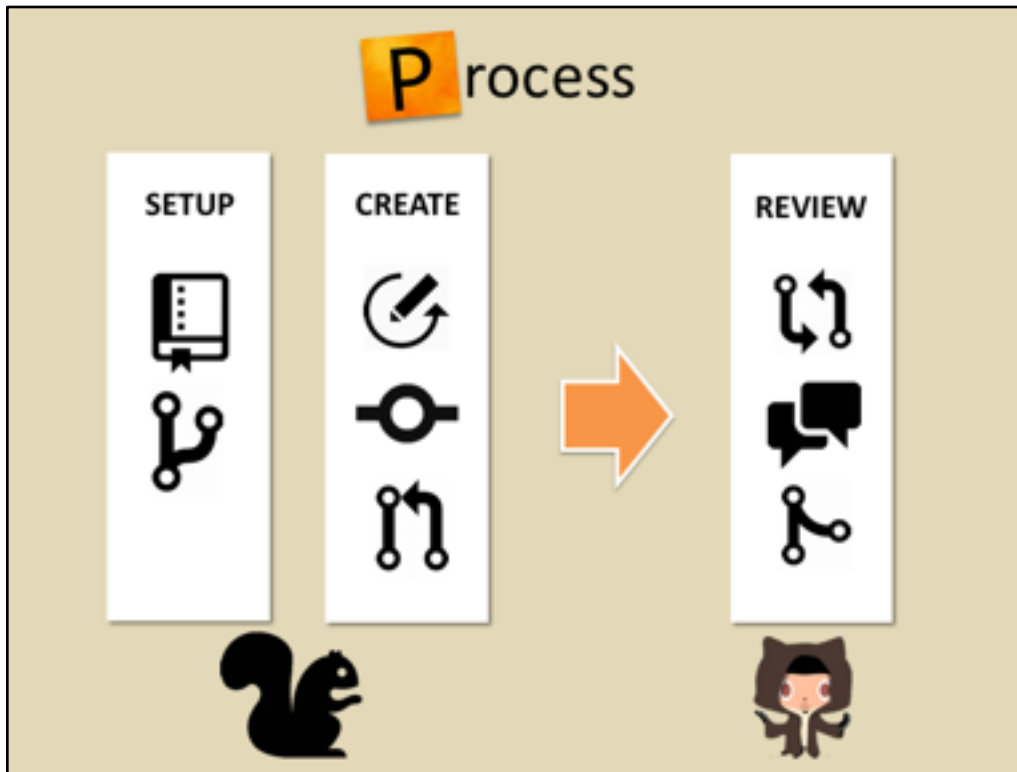
Octocat likes what he sees, so is ready to merge.

He goes ahead and  clicks the big Green button.



2 ... and now Zippy and Octocat's changes are  ONE! 

These review steps help us eliminate issues like bad acorns TOGETHER!



5 [▶](#) Here's the GitHub Workflow which Octocat just walked through. [▶▶▶▶](#)

It helps accomplish the goals you're trying to achieve...

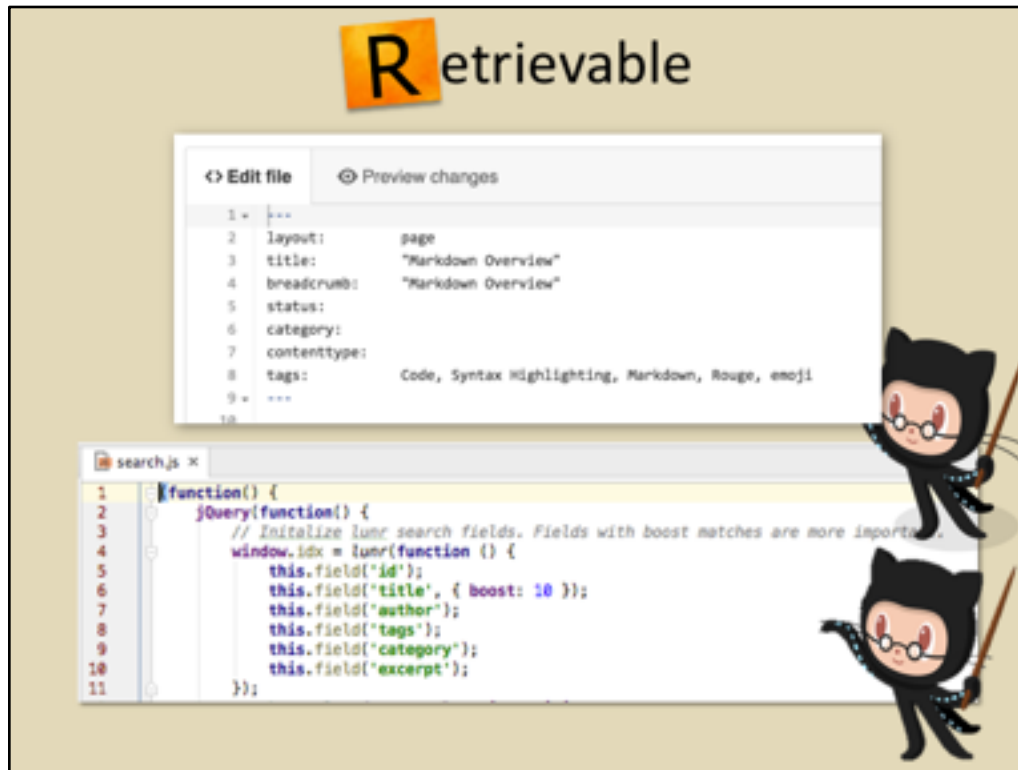
This process is built on communicating, reviewing and preserving a historical record of all changes made.


## R retrievable



“Putting all of this stuff into a repository isn’t helpful unless the acorns are Retrievable once they go into the forest.


You want a mechanism for allowing squirrels to be able to find the acorn that they need quickly.”



2 “By adding  information called “Front Matter” to the front of each Acorn’s Markdown, you can use it to help with searches.

Jekyll and GitHub Pages use FrontMatter to build a smart index for search.”

This data can contain Title, Tags or anything a squirrel might want to add.

 The search index builder is configured to use these fields.

## One Place



Zippy complained about having to look everywhere for acorns stored willy-nilly.

GitHub helps with that by keeping everything in One Place.

There acorns will grow into a forest of big oaks for your scurry members to live and thrive.

Where you plant and maintain your acorns impacts future growth and benefits everyone down the line.

## **D**on't Repeat Yourself (DRY)



Zippy, it is very important to remember!

Make sure that you don't add acorns that are already in the forest.  
It is important for your content to be unique!!!

If something already exists, enhance it!

## U ncomplicated



The most effective content will be simple and easy to read.  
This has a lot to do with writing style and discipline.

Keep things short and comprehensive...  
if your topic is getting too long,  
break it down into its smallest components.

This is the art of working bottom up  
to create the simplest, readable content!



## Culture Change



- 1 Zippy started to walk ahead and exclaimed:  
"Surely this is straightforward so far Master, it even looks easy!"

Octocat looked back in disbelief: "There is still much to learn young one."

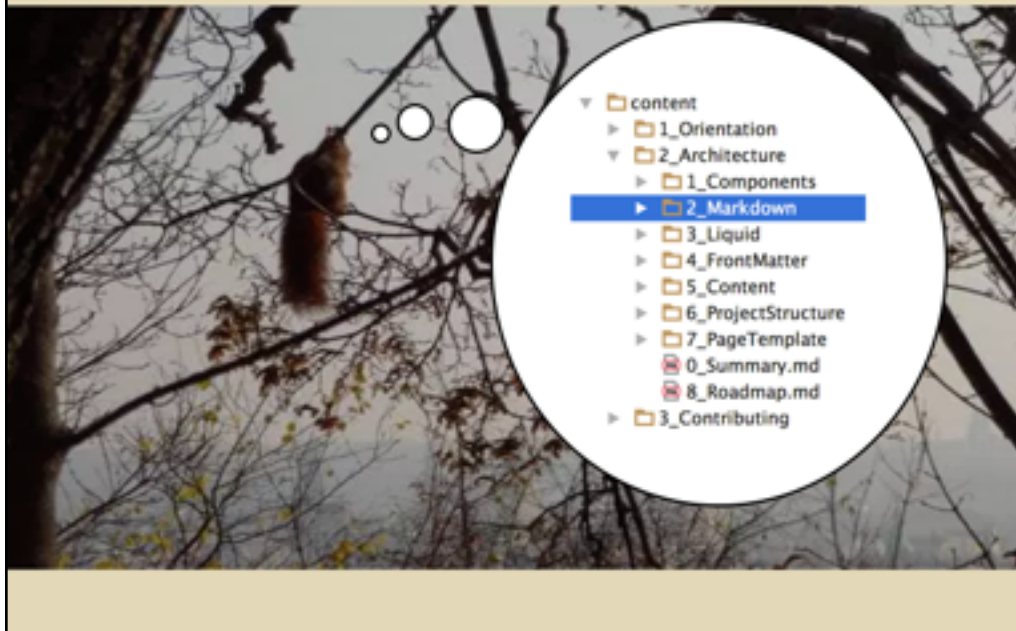
▶ "Culture Change will be a difficult, but necessary and very important part of making this whole thing work."

"Changing minds and hearts to different ways takes other skills which you will learn."

"Keep communicating."

"Get others involved. Everyone owns the acorns."

# Taxonomy

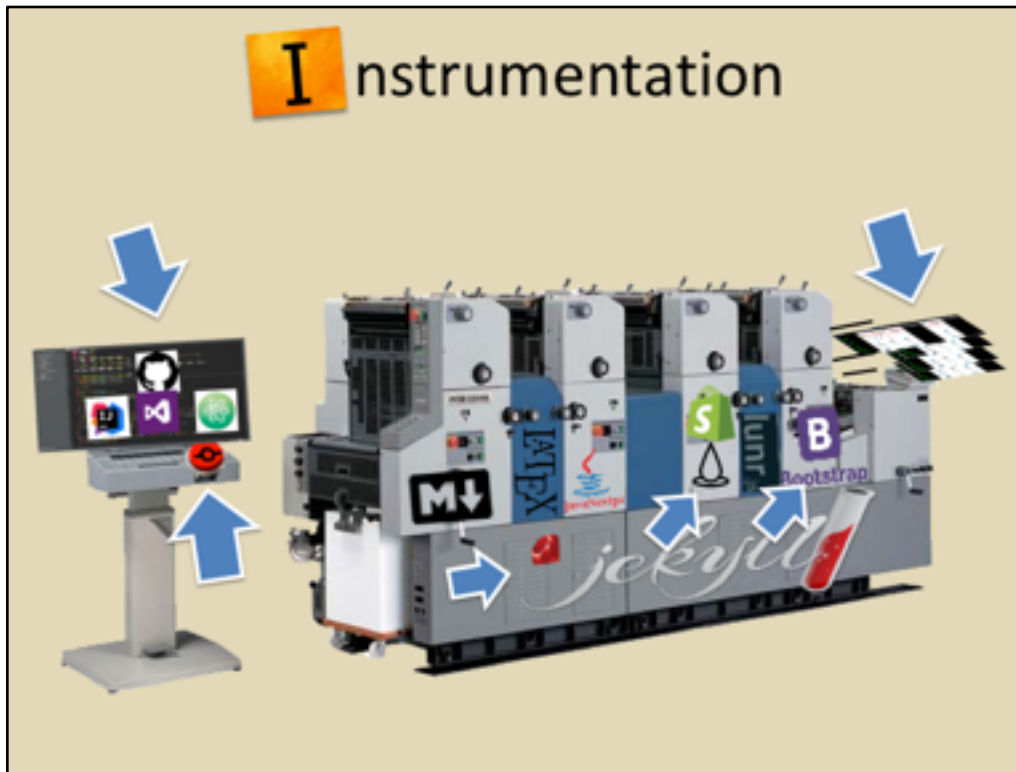




1 “There are many acorns to gather and arrange.  
Sometimes it helps to imagine all the acorns in the forest and how they fit together.”




“If this seems too hard, envision yourself in the tallest tree, on the highest limb.  
Look from the top down and arrange all the acorns in your mind  
according to which tree branches they really belong to.



“Then use naming to identify and order all your acorns into a Taxonomy which  
structures your forest.

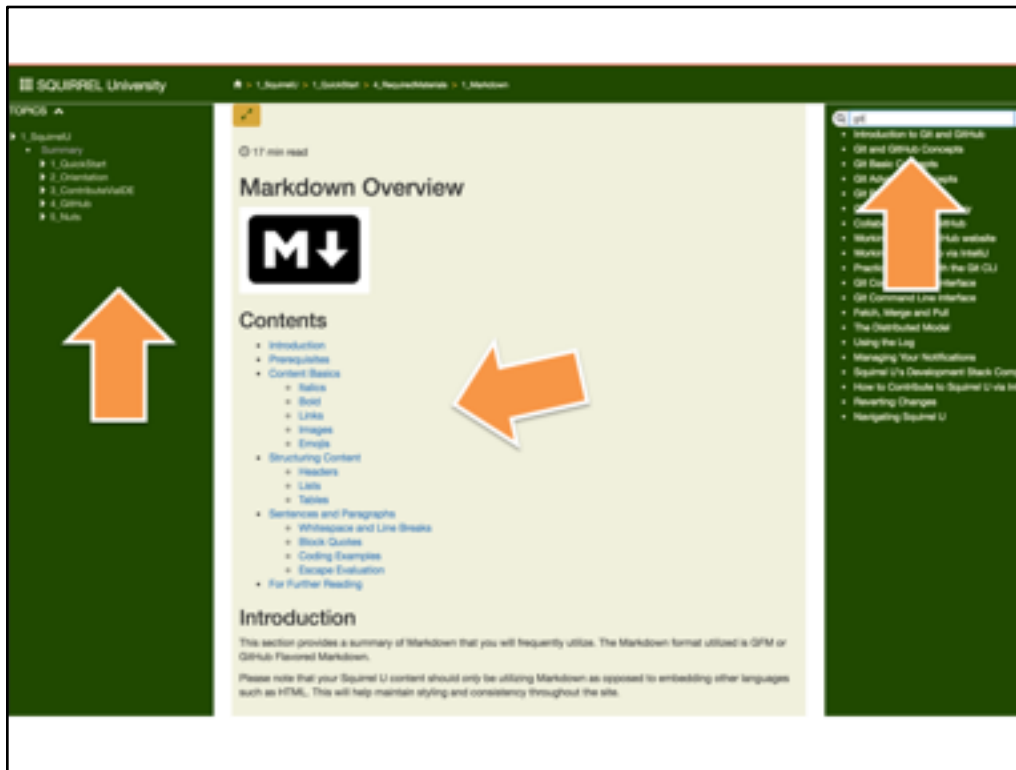


8 “By creating and  committing content acorns using the simple language of Markdown, GitHub Pages machinery will transform your acorns into a beautiful  knowledge forest of pages”.

-  Ruby and Jekyll turn your Markdown into html.
  -  Shopify’s Liquid language preprocesses your content into templates and table of contents.
- Rouge provides beautiful syntax highlighting.
-  Bootstrap provides pages that work on devices of all sizes.

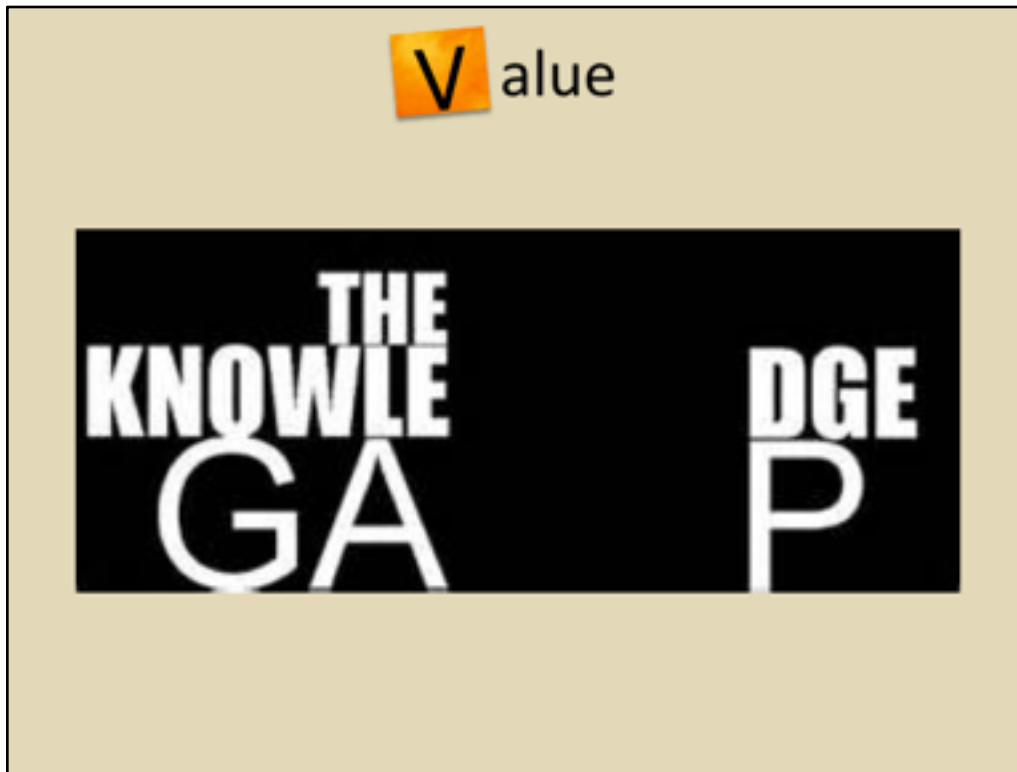
Let all this instrumentation tools do the work for you!





3 With Jekyll and your own creativity you can render stunning pages that contain:

- ▶ a Hierarchy,
  - ▶ A speedy search index from your FrontMatter,
  - ▶ a Table of Contents for every topic header and
- Syntax Highlighting



Zippy's eyes widened.

"That looks so amazing and easy Octocat, everyone will want to use this!!!"

Octocat sighed: "Maybe so, but any squirrel can use these tools to add acorns of LOW Value."

"Squirrels can be lazy and blind to what they already know.

This is called the Curse Of Knowledge. They think that others already know what they know."

How many times have you read something or had something explained to you as though it were the most obvious thing in the world... only to be left more confused than before?

**V**alue

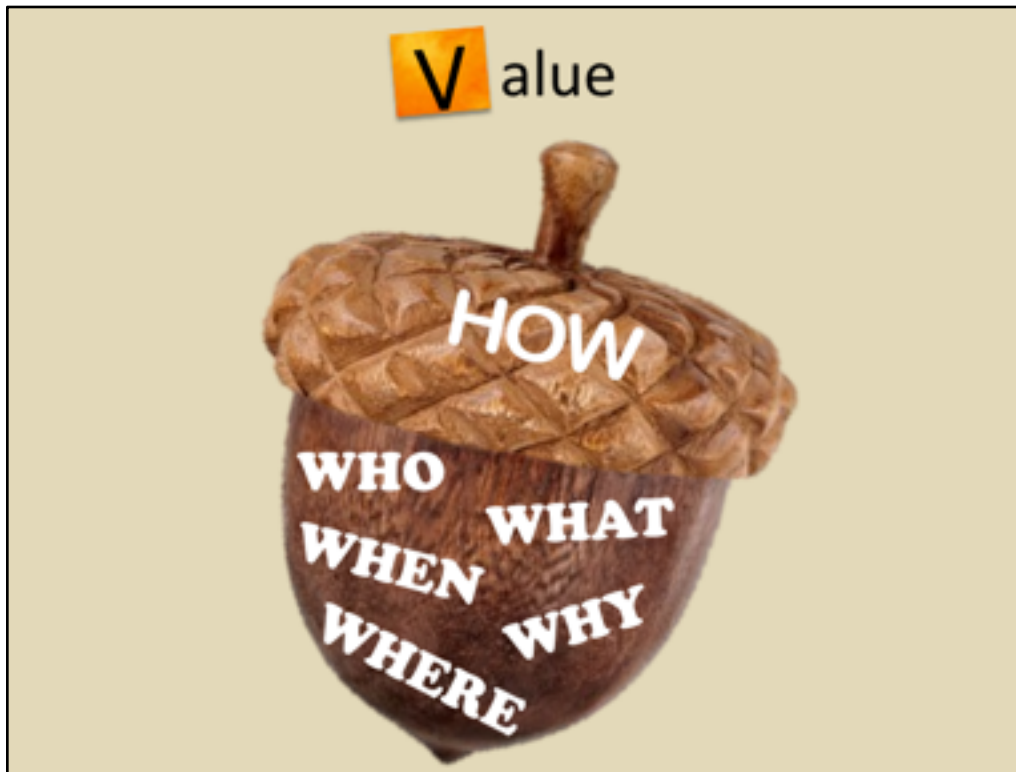



A little context goes a long way!

Zippy asked: What is context?


Octocat stretched out his arms to show that:  
"Context fills the gap between what YOU KNOW and  
what other squirrels may NOT YET KNOW.

Move this over to next



- 2 Squirrels are content to add the  "HOW" part but often leave out the most important part: Context!

"This is like finding only an acorn Cap and calling it an Acorn. Yet it is not a complete Acorn!"

-  "What, Why, When, Where, Who" are just as important as "How" and provide context.

Simply adding an acorn doesn't mean that the job is done.  
We have to generate acorns that other squirrels can actually consume.  
Context helps create complete acorns of true Value."



## E volve



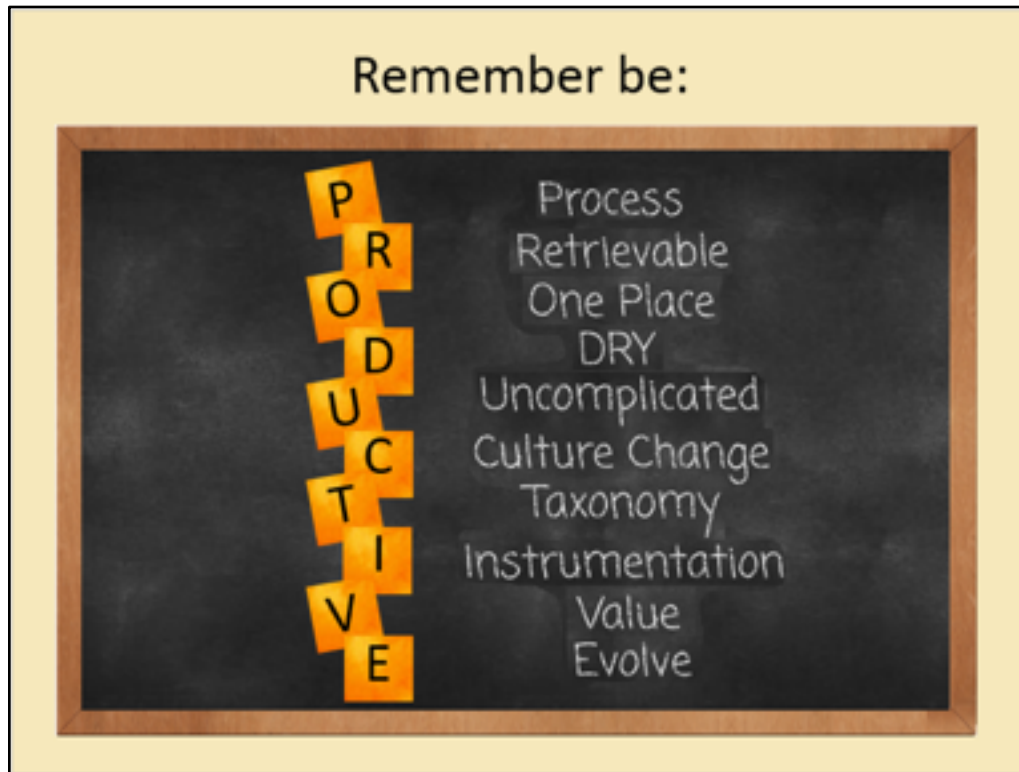
Zippy jogged ahead again:  
“Master, I think that I am ready.”

Octocat remained motionless.  
“There is one more lesson which you must learn!  
Don’t let your acorns rot and keep your forest pruned.  
Your content and tools needs to EVOLVE with the organization.

You will need to come up with your own guidelines  
and rules that work best for everyone.

Your forest is a living, breathing organism that  
has to be maintained and nurtured...treat it as such!”





1 Finally, Octocat smiled: “If you follow these lessons, you will be **PRODUCTIVE!**”



Zippy returned to his scurry, very excited to share his new ideas.




Everyone else seemed skeptical...  
after all, they'd always done things the same way.

Tribal ownership was a very strong force to overcome.



1 But Zippy persisted, remembering what Octocat had taught him.

He wanted to create a learning forest and call it  "Squirrel University".

Slowly but surely, he started working through the barriers.

## Management Engagement



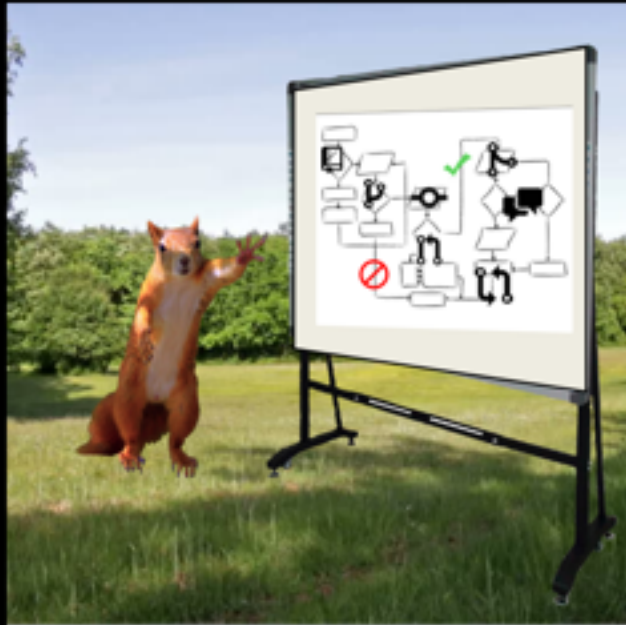
Yaaaa...I'm gonna need you to add that to Squirrel U...  
That'd be greeeeaat.

First, Zippy made it a point to get management's backing.  
With their help and support...the transition would be much easier.

Depending on your management types,  
this could be your biggest challenge.  
Hopefully it is much easier than this!

AUDIENCE: Would this be supported in your teams?

## Change the Process



After gaining his manager's support, Zippy added his new learnings into their process.

Zippy and his managers made these changes official and broadly communicated the expectations to the scurry.

No longer could scurry members continue to do things the way they always had.

Now when things changed during a Squirrel Sprint, Team members were required to update those acorns in Squirrel U.

## Finding Your Leaders



Zippy knew that he couldn't do this by himself.

He observed that the Grey squirrels in his scurry were the best leaders in planting acorns.

They instinctually contributed to growing trees of knowledge in the forest.

*However*, because there wasn't a designated place for planting them, the acorns often grew in the wrong places or were forgotten.

Recruiting the Grey squirrels to plant their acorns in Squirrel U was a key to getting the forest started and beginning to thrive.

The other squirrel breeds copied the Grey squirrel's habits and efforts.



Zippy is eager to share this video of a TED Talk by Derek Sivers on starting a movement... this entire process is depicted in less than 3 minutes.

It seemed to describe exactly how his experience had gone.

CUT @ 1:55, ... and that's how you start a movement!



## Agents of Culture Change



These Leaders converted passionate squirrels into forest evangelists.

They enthusiastically spread the word and got their hands dirty.

They organized the large amount of known acorns.

They identified acorns which were still needed.

They taught other squirrels how to contribute their valuable acorns.

## Quality Acorns



Zippy also pulled together a group of expert squirrels and gave them jobs as the “gatekeepers” to the forest content.

They ensured that only quality acorns made it into the forest by checking that:

- the acorns were relevant (oak acorns not walnuts!).
- The acorns are complete with CONTEXT
- the acorns were accurate with sufficient detail.
- the acorns weren’t duplicates.
- The acorns were being planted in the right places.

By inspecting pull requests they addressed issues *before* the acorn was planted.

## Squirrel Training Facility



2 From there, the community started their training.

▶ They learned how to use GitHub and ▶ the new process of planting acorns... strengthening their acorn-planting skills.

Along the way, Zippy and his leaders were there to help reinforce the concepts the Octocat had introduced.

By planning for these things in their sprints, and working on these a little bit each day, their forest was growing.

## Paired Prosing



He also introduced “paired prosing”, like “paired programming”... encouraging squirrels to work together to plant their acorns.

Just like with coding, having more than one set of eyes on the task helps to create better, more comprehensive content.

## Everyone's Nuts!



Zippy encouraged the scurry to team up with other members of the forest.

This exercise brought in fresh skillsets and perspectives.

They were able to tap the experts to get the best information.

They found the strongest writers and collaborators!

It became every squirrel's job to actively prune the growing trees to remove dead information and to update changes.

## Growth Takes Time



3 Throughout this whole process, Zippy learned the importance of patience. This wasn't an overnight process.

- ▶ He had to remain diligent and disciplined in continuing showing scurry members the right way.
- ▶ Growth of any tree takes time, so you have to ▶ keep watering the soil and
- ▶ encouraging the community to help and keep planting.



## Tipping Point



2 Oak trees produce a decent amount of acorns for the first few seasons of it's life.

- ▶ But after a few seasons, it explodes with thousands of acorns!

Knowledge planted in the learning repository is much the same.

- ▶ If the tree stays healthy, there is a tipping point where the volume of quality acorns that it provides is overwhelmingly valuable.

Life is good...



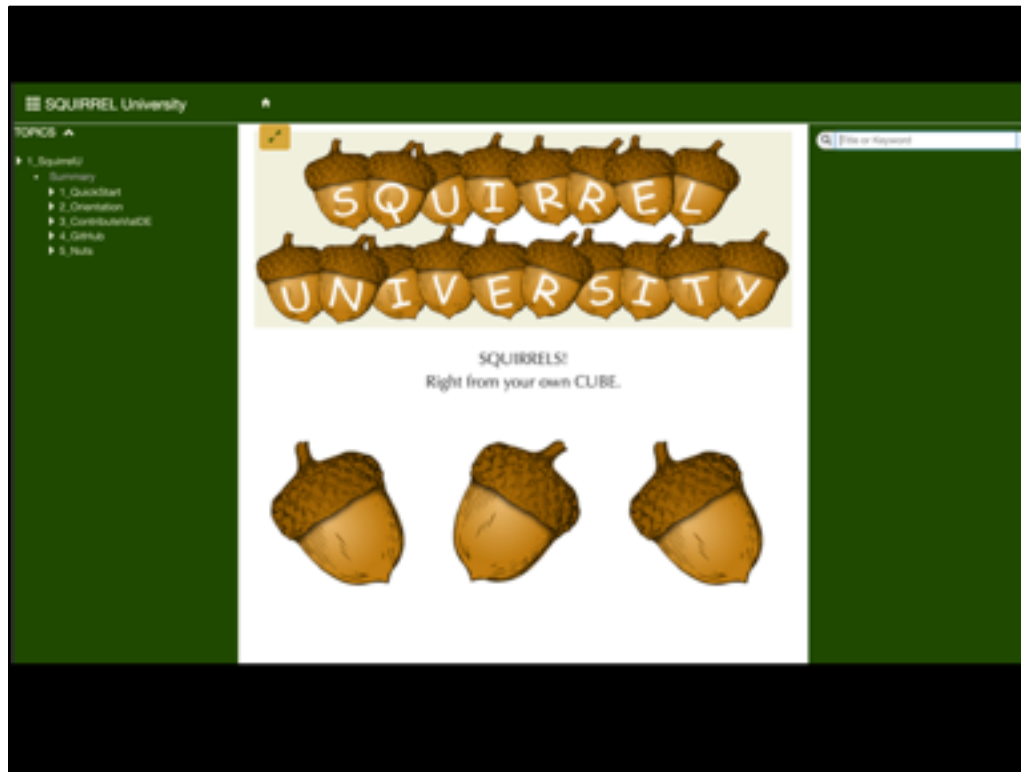
1 Finally the squirrels in the scurry are communicating and sharing their acorns.

Zippy's scurry has learned that instead of only eating acorns for immediate gratification; Those well planted acorns produce new trees that become learning homes,



Which in turn, produce even more acorns which feed lots of squirrelly developers.





So that's Zippy's story as I heard it.

Since then Zippy has made tremendous progress on Squirrel U.  
I thought that you might be interested in his progress.  
Let's take a look!



Our team has continued to build upon Zippy's efforts.  
We are using these tools in our work teams.  
60+ developers are involved in gathering content.  
We've added a nice setup for developers to run locally in your IDE.

These investments of time are paying us back!

- New team members are up and running faster.
- Competent developers have plenty to sharpen their teeth.
- Senior architects stay focused on their main jobs.
- Efforts on higher level problems – not problems already solved.
- Tribal knowledge has transformed into real learning trees!

No Squirrels were harmed in the making of this Presentation.



appearance courtesy of GitHub.

Octobl Wan Catnobi wardrobe courtesy of Octodex.

Sales Support: Craig Morrall [craigmorrall@github.com](mailto:craigmorrall@github.com)

A big thanks to our DevOps and CM squirrels for helping with this event:

Jane Bracken

**Jim Fox** our Manager (no we didn't have to come in on Saturday)

Melissa Mosser

Maria Jeannet

Dan Ben

Isaac Higgins

Mike Lively

Travis Wyrick

Suzanne Wilkerson



2 Before we get too far from the scurry,

▶ I want to thank GitHub for providing such a great product!

Plus, ▶ my team that was so supportive in creating our learning environment and this presentation.



Thank you for joining us on our never ending hunt for acorns today.

Please take an Acorn back to your workplace.

Plant these acorns in your teams.

Grow them into your own healthy information forests.

Finally, enjoy the benefits of having more time and energy to produce great products!



Zippy looks forwards to meeting you again!

If you've any questions or are interested in collaborating, come on up!