

Welcome!



Debating Two Viewpoints on Indexing: Development vs Operations

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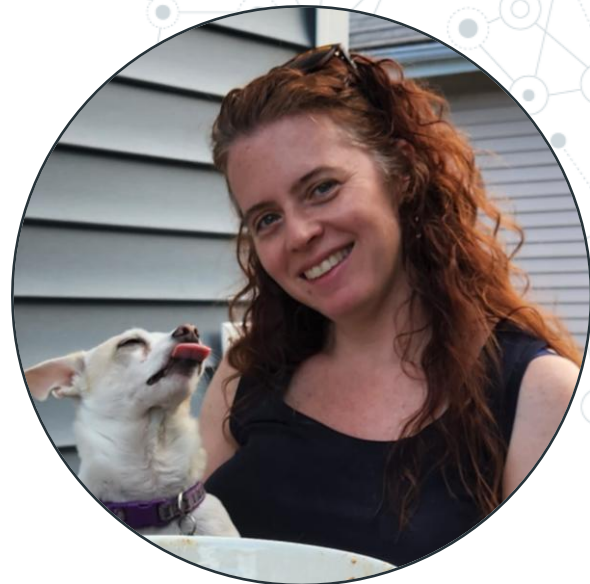
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Database Developer

- Microsoft MVP – Data Platform
- Data Platform Women In Tech (WIT) co-leader
- WITspiration co-founder
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Field Solution Architect

- SQL Server DBA & DB Developer (~25 years)
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Quiet Monday Morning...



I need an
index created!

Who can help
me out?

Data?

a Dog Person

Indexing: Whose Job Is it?

- © Ownership?
- © Who Decides?

What do
you think?





I'm creating the application code, I should also create the indexes!

Not sure I trust you. I've been burned too many times by developers who don't understand indexing...



That's harsh!
Explain
yourself



- ◎ One bad apple...
- ◎ Single column indexes...
- ◎ Know what the “Tipping Point” is?
 - You want an Index seek
 - NCI does not cover the query
 - Key Lookup?
 - But you get a scan!

The Tipping Point

- ◎ Index seek + key lookup -> estimated rows is below 25% of the # of pages in the table
- ◎ Full scan -> estimated rows exceeds 33% of the # of pages in the table
- ◎ In between 25% and 33% it can go either way
 - *(Usually but not always)*

<https://www.sqlskills.com/blogs/kimberly/the-tipping-point-query-answers/>

<https://sqlperformance.com/2020/05/t-sql-queries/visualizing-the-tipping-point-with-plan-explorer>



It's crazy nuances like the Tipping Point, which many are ignorant of, that makes me leery of trusting others about indexing.



But do all DBAs know that too?

Not all DBAs are well versed in T-SQL coding.

More importantly, not all Devs are the same either!

	Developer	Development DBA	Production DBA
Write C#, Java code	Daily		
Build queries, tables	Daily	Sometimes	
Tune queries	Sometimes	Daily	
Design indexes		Daily	
Monitor performance		Daily	Sometimes
Troubleshoot outages			Daily
Manage backups, jobs			Daily
Install, config SQL			Sometimes
Install, config OS			Sometimes

Deb's Favorite Indexing Learning

© Kimberly Tripp

<https://www.sqlskills.com/blogs/kimberly/>

© Kendra Little

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<https://erikdarling.com/>



But you don't see how the indexes are **ACTUALLY** used in your Production codebase.



The Query Optimizer may not even use your index. It has a mind of its own!



That's why I requested VIEW SERVER STATE permissions AGES ago, when Sebastian was just a little puppy!!!



How can you make indexing decisions, when you're not intimately familiar with this application & code?



Besides, you manage TONS of databases... you can't be an expert in all of them!

How many
databases
do YOU
manage?

Just one?

More than a
hundred??

- ◎ How is the codebase utilized?
 - Single or multi-client user base?
 - Per-client customizations?

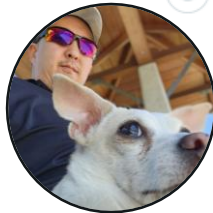




Frankly, I'd argue that Ops doesn't need to know that. We work and manage at the Instance level.

To put it another way, I don't need to know "why" users are doing something. I only care about "what" they're doing right now.

And I have tooling and telemetry to summarize what I need to know about index usage in Prod.





But speaking of knowing one's codebase, here's something that really grinds my gears.



We regularly get releases with indexes that redundantly overlap existing or are outright duplicates!



Duplicate Indexes

Customer Table with Index on:

⦿ LastName, FirstName, *CustomerID*

Release adds a new Index on:

⦿ LastName, FirstName, CustomerID

What if CustomerID is the
Clustering Key?

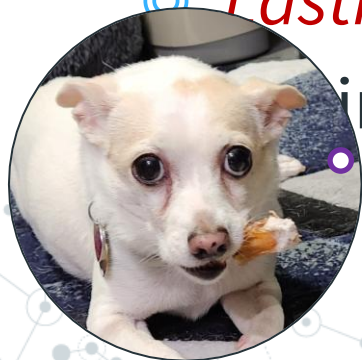
Redundant Indexes

Customer Table with Index on:

⦿ LastName, FirstName, BirthDate, CustID

Release adds a new Index on:

⦿ *LastName, FirstName, BirthDate, CustID*



imized

Didn't someone
called "SQLBek" have
a session about this
stuff too?

queries

sp_IndexCleanup

- ◎ New Tool from Erik Darling!!!
- ◎ Finds duplicate, redundant, and unused indexes

https://erikdarling.com/sp_indexcleanup/

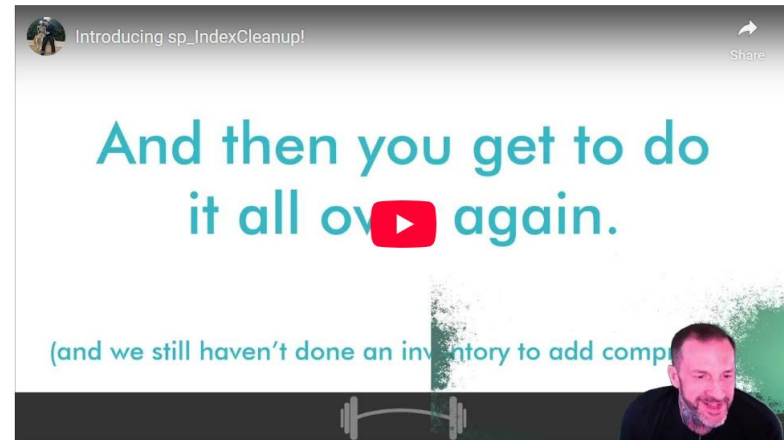


Blog Consulting Learn Scripts Cont

Introducing sp_IndexCleanup!

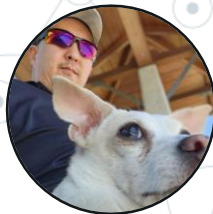
Posted on April 23, 2025 by Erik Darling

Introducing sp_IndexCleanup!

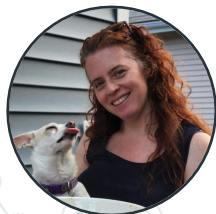




Anyway, I did my own audit on your database and am going to nuke about 45 indexes on Friday night.



WHOA, what?! Stop right there!!!



Don't you remember the last time you did an index clean-up? Sadie the CFO ring any bells?

Single Source of Truth

- ◎ Source Control
- ◎ Risk breaking future releases?
 - Ex: Refactored the CustomerProduct table
- ◎ Query refactoring?
 - Whose index is obsolete now?



Wouldn't you be making the duplicate & redundant indexing problem worse, if you made indexing changes and never told us?

Yeah, that's fair.



How about you give me access to source control in exchange for VIEW SERVER STATE? 😊



Now For a Twist...

- ◎ We both work at the same company...
- ◎ But what if we didn't?

"Deb the
Vendor
Developer"

"Andy the
Customer
Ops DBA"

Anyone
support a 3rd
party vendor
application?





Look, you're not our only customer. We have dozens.

Except I know we're your **LARGEST** customer.

We have more data volume than your next three largest customers **COMBINED!**





So, did you ever review and apply our Best Practices doc? That addresses a lot of perf issues.

Those recommendations are fine for “normal sized” customers. But they do not scale for our data volume!



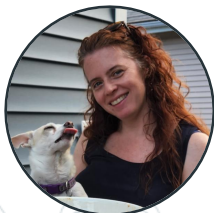
Doesn't scale well? Have you tried a different scale?



Joking aside, Prod performance is horrible. This is YOUR app and YOUR codebase – you need to do something about it.



I spoke to management. They'll give me time next sprint.

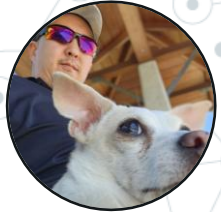


After QA & release approvals, we can get you a custom hotfix in 4-5 weeks.



4 – 5 WEEKS?!?! How is that acceptable at all?

My users of YOUR application are here at my cube
RIGHT NOW with plastic spoons and forks!

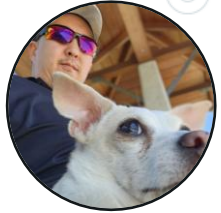
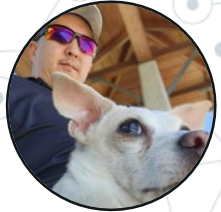


I'm sorry, that's the best I can do. We have our own
processes too.



... And my management just declared a Sev-1.

I don't care if the vendor "owns" the code. I have a fire to put out now.



Hot Take

Indexing should not belong
to whoever owns the code
instead...

Whoever is responsible for
performance tuning



*“I Like Running
Fast Too!”*

Customer Ops Priorities

- ◎ Keeping the “lights on” and “users happy”
- ◎ Anyone ever go rogue & apply your own custom indexing?
- ◎ Hot Take #2: Make Your Own Index Changes
 - ... with a back-out plan

Vendor Developer Priorities

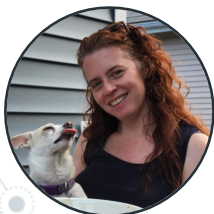
- ◎ Vendors SHOULD be putting out good code...
 - Juggling many customers
 - New features vs technical debt
- ◎ What's the vendor release/hotfix process
 - Legal constraints



Argh – they’re calling yet another Sev-1 for Prod Performance! That’s the third this week!



So my senior VP just learned about Missing Index Recommendations. They’re mandating that I apply them to Production... all... of... them...



What?!? You can’t be serious?!? That’s a HORRIBLE idea!!!

Missing Indexes: Good or Bad?

⦿ Limitations:

- Per execution plan
- Column order
- Inequality predicates
- Included columns

⦿ Index another table instead?

Is there
ANYTHING good
about them?





We're getting nowhere. How can we resolve this?
These Sev-1's for performance issues are killing me.



We really need access to Production telemetry... DMV
info... execution plans...

Let's brainstorm together... there's got to be some
viable solutions!




Bridging the Gap

- ◎ SSMS: Export Statistics
- ◎ Creation of Test Data
- ◎ SAN Snapshots
- ◎ Redgate SQL Clone

Check out what
I just found on
BarkGPT





```
DBCC CloneDatabase (  
    MyDatabase,  
    MyDatabaseClone  
)  
  
WITH (  
    BACKUP_CLONEDB  
)  
;
```

- ◎ You get:
 - Statistics
 - Query Store
 - Portability
- ◎ You don't get:
 - Data



I'd totally forgotten about DBCC CLONEDATABASE!

Getting query store too – that'll definitely help performance troubleshooting!

Me too! It's definitely overlooked.

But in this case, I think it'll be a tremendous help for both of us!





I think we finally have a path forward.

And we'll sort out a process for you to "hotfix add" indexes but get them back to us for source control.

And I'll work on a process to regularly get you snapshots or clones of Production, so you can test against the latest and greatest.



Parting Thoughts

- ◎ A matter of communication between both parties
 - Create processes for efficiency
- ◎ Both parties should have input
 - Understand each group's priorities
- ◎ Respect
 - Be willing to teach
 - Be willing to listen



Zzzzz... ?!

Are you two
finally done?

n – we've sorted things out and we'll
together to create you that new index.

... uhh, Sebast



Learn More: Indexing Resources

Missing Indexes: Do's and Don'ts – Andy Yun

<https://youtu.be/-HaKRArxDzQ>

Uncovering Duplicate, Redundant, and Missing Indexes – Andy Yun

https://youtu.be/JPIL_Vq3gHc

Visualizing the Tipping Point – Greg Gonzalez

<https://sqlperformance.com/2020/05/t-sql-queries/visualizing-the-tipping-point-with-plan-explorer>

Index Design & Tuning – Kendra Little

<https://kendralittle.com/topics/index-design-and-tuning/>

Indexing Blogs – Kimberly Tripp


<https://www.sqlskills.com/blogs/kimberly/category/indexes/>

Indexing Blogs – Erik Darling

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Thank You!

Any Questions?

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