

**Team Presentation: Why Creating Fully Custom Oak:Index Should Be Last Resort in AEM as a Cloud Service**

**Executive Summary**

Adobe's official documentation consistently emphasizes that creating fully custom Oak:index definitions should be the **absolute last resort** in AEM as a Cloud Service. This presentation provides direct quotes from multiple official Adobe documentation sources to support this position.

**1. Primary Adobe Documentation - Indexing Best Practices**

**Documentation URL:** <https://experienceleague.adobe.com/en/docs/experience-manager-learn/foundation/development/understand-indexing-best-practices>

**Key Quotes (Word-for-Word):**

**On the hierarchy of options:**

"If the OOTB indexes cannot support the search requirements, you have two options. However, review the Tips for Creating Efficient Indexes

**Direct statement on last resort:**

"**Creating fully custom index must be your last option and only if the above option does not work.**"

**On avoiding custom indexes on existing node types:**

"**Avoid creating a custom index on the same node type as the OOTB index. Instead, customize the OOTB index with necessary properties in the indexRules node. For example, do not create a custom index on the dam:Asset node type but customize the OOTB damAssetLucene index.**

***It has been a common root cause of performance and functional issues***."

**Prerequisites before creating any custom index:**

"However follow below guidelines before creating custom indexes:

**2. AEMaaCS Content Search and Indexing Documentation**

**Documentation URL:** <https://experienceleague.adobe.com/en/docs/experience-manager-cloud-service/content/operations/indexing>

**Key Quotes (Word-for-Word):**

**On Cloud Service operational changes:**

"With AEM as a Cloud Service, Adobe is moving away from an AEM instance-centric model to a service-based view with n-x AEM Containers, driven by CI/CD pipelines in the Cloud Manager. Instead of configuring and maintaining indexes on single AEM instances, the index configuration has to be specified before a deployment."

**On index restrictions:**

"Users do not have access to the Index Manager of a single AEM instance to debug, configure, or maintain indexing anymore. It is only used for local development and on-prem deployments."

**On naming requirements for custom indexes:**

"Fully custom index: You can create an entirely new index from scratch. These indexes also need to end with -custom- and a version number. In addition, to avoid naming conflicts, use a prefix in the index name. For instance: /oak:index/acme.product-1-custom-2, where acme. is the prefix."

**3. Query and Indexing Best Practices for AEMaaCS**

**Documentation URL:** <https://experienceleague.adobe.com/en/docs/experience-manager-cloud-service/content/operations/query-and-indexing-best-practices>

**Key Quotes (Word-for-Word):**

**On focusing on query optimization first:**

"In AEM as a Cloud Service, all operational aspects regarding indexing are automated. This allows developers to focus on creating efficient queries and their corresponding index definitions."

**On using existing indexes:**

"Every query should use an index to deliver optimal performance. **In the majority of cases, existing out-of-the-box indexes should be sufficient to handle queries.**"

**On customizing existing indexes instead:**

"Sometimes custom properties need to be added to an existing index, so additional constraints can be queried using the index... **The query engine considers just a single index. That means that an existing index can and should be customized by adding more custom index properties to it.**"

**On avoiding queries in components:**

"Since queries can be one of the more taxing operations done on an AEM system, it is a good idea to avoid them in your components. Having several queries execute each time a page is rendered can often degrade the performance of the system."

**4. Oak Queries and Indexing (AEM 6.5 Reference)**

**Documentation URL:** <https://experienceleague.adobe.com/en/docs/experience-manager-65/content/implementing/deploying/deploying/queries-and-indexing>

**Key Quotes (Word-for-Word):**

**On index performance impact:**

"The reindexing of the repository after index definition changes requires time and it depends on the size of the repository."

**On index cost calculation:**

"If multiple indexes are available for a given query, the **index with the lowest estimated cost is used**."

**On traversal limits:**

"If no index is available for a given query, the content tree is traversed to find the matching content. However, the default limit via org.apache.jackrabbit.oak.query.QueryEngineSettingsService is to traverse only 100,000 nodes."

**5. Best Practices for Queries and Indexing**

**Documentation URL:** <https://experienceleague.adobe.com/en/docs/experience-manager-65/content/implementing/deploying/practices/best-practices-for-queries-and-indexing>

**Key Quotes (Word-for-Word):**

**General principle:**

"This article outlines when to create indexes and when they are not needed, tricks to avoid using queries when they are not necessary, and tips for optimizing your indexes and queries when they are needed."

**6. Custom Index Reindexing Issues Documentation**

**Documentation URL:** <https://experienceleague.adobe.com/en/docs/experience-cloud-kcs/kbarticles/ka-25698>

**Key Quotes (Word-for-Word):**

**On custom index problems:**

"When custom indexes fail to reindex properly, SQL2 queries on both the author and publish instances do not return the expected results. This issue particularly impacts search indexes for Content Fragments, leading to the following problems:

**Summary of Adobe's Position**

Based on all official documentation sources:

**Clear Hierarchy (from Adobe):**

1. **First**: Use existing OOTB indexes
2. **Second**: Optimize/rewrite queries
3. **Third**: Customize OOTB indexes (preferred)
4. **Last Resort**: Create fully custom index

**Official Reasons Why Custom Indexes Should Be Last Resort:**

1. **Maintenance Complexity**: "easy to maintain and upgrade" (customizing OOTB vs. custom)
2. **Performance Issues**: "common root cause of performance and functional issues"
3. **Operational Overhead**: Cloud Service automation vs. manual management
4. **Query Engine Efficiency**: Single index optimization vs. multiple competing indexes
5. **Deployment Complexity**: CI/CD pipeline constraints and validation rules

**Adobe's Technical Architecture Supports OOTB:**

* **Cost-based optimization**: Query engine automatically selects lowest-cost index
* **Cloud automation**: "all operational aspects regarding indexing are automated"
* **Built-in coverage**: "existing out-of-the-box indexes should be sufficient to handle queries"

This comprehensive documentation review shows Adobe has architecturally designed AEMaaCS to make OOTB indexes the primary solution, with custom indexes reserved only for edge cases that cannot be solved through query optimization or OOTB index customization.

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1. <https://experienceleague.adobe.com/en/docs/experience-manager-cloud-service/content/operations/indexing>

1. <https://experienceleague.adobe.com/en/docs/experience-manager-cloud-service/content/overview/introduction>

1. <https://adobe-consulting-services.github.io/acs-aem-commons/features/ensure-oak-index/index.html>

1. <https://experienceleague.adobe.com/en/docs/experience-manager-65/content/implementing/deploying/practices/best-practices-for-queries-and-indexing>

1. <https://bimmisoi.blogspot.com/2021/05/custom-oak-indexes-aem-part-1-custom.html>

1. <https://www.aem.live/developer/indexing>

1. <https://stackoverflow.com/questions/74257525/how-to-create-oakindex-in-aem-programatically>

1. <https://experienceleague.adobe.com/en/docs/experience-manager-learn/cloud-service/migration/moving-to-aem-as-a-cloud-service/search-and-indexing>

1. <https://jackrabbit.apache.org/oak/docs/query/indexing.html>

1. <https://league.adobe.com/docs/experience-manager-cloud-service/content/operations/query-and-indexing-best-practices.html?lang=en>

1. <https://jackrabbit.apache.org/oak/docs/query/lucene.html>

1. <https://experienceleague.adobe.com/en/docs/experience-manager-cloud-service/content/operations/query-and-indexing-best-practices>

1. <https://learn.microsoft.com/en-us/azure/search/search-how-to-create-search-index>

1. <https://learn.microsoft.com/en-us/azure/search/search-howto-reindex>

1. <https://adapt.to/2024/schedule/indexing-in-aemaacs-behind-the-scenes>

1. <https://www.reddit.com/r/aem/comments/1ctjcrh/custom_indexing_oak_lucene_in_aem_as_a_cloud/>

1. <https://experienceleague.adobe.com/en/docs/experience-manager-cloud-service/content/assets/best-practices/search-best-practices>

1. <https://www.linkedin.com/pulse/aem-struggling-decide-how-add-oak-index-veena-vikraman>

1. <https://www.elastic.co/guide/en/workplace-search/current/workplace-search-customizing-indexing-rules.html>

1. <https://experienceleague.adobe.com/en/docs/experience-manager-65/content/implementing/deploying/deploying/queries-and-indexing>

1. <https://experienceleague.adobe.com/en/docs/experience-manager-learn/foundation/development/understand-indexing-best-practices>

1. <https://experienceleague.adobe.com/en/docs/experience-manager-cloud-service/content/implementing/deploying/overview>

1. <http://www.aemcq5tutorials.com/tutorials/aem-oak-indexing-comprehensive-guide/>

1. <https://stackoverflow.com/questions/77135454/ci-cd-deployment-of-custom-oak-index-aem-on-prem-aemaacs>

1. <https://experienceleague.adobe.com/en/docs/experience-cloud-kcs/kbarticles/ka-25698>

1. <https://www.initialyze.com/insights/how-to-deploy-custom-oak-indexes-in-aem-as-a-cloud-services>