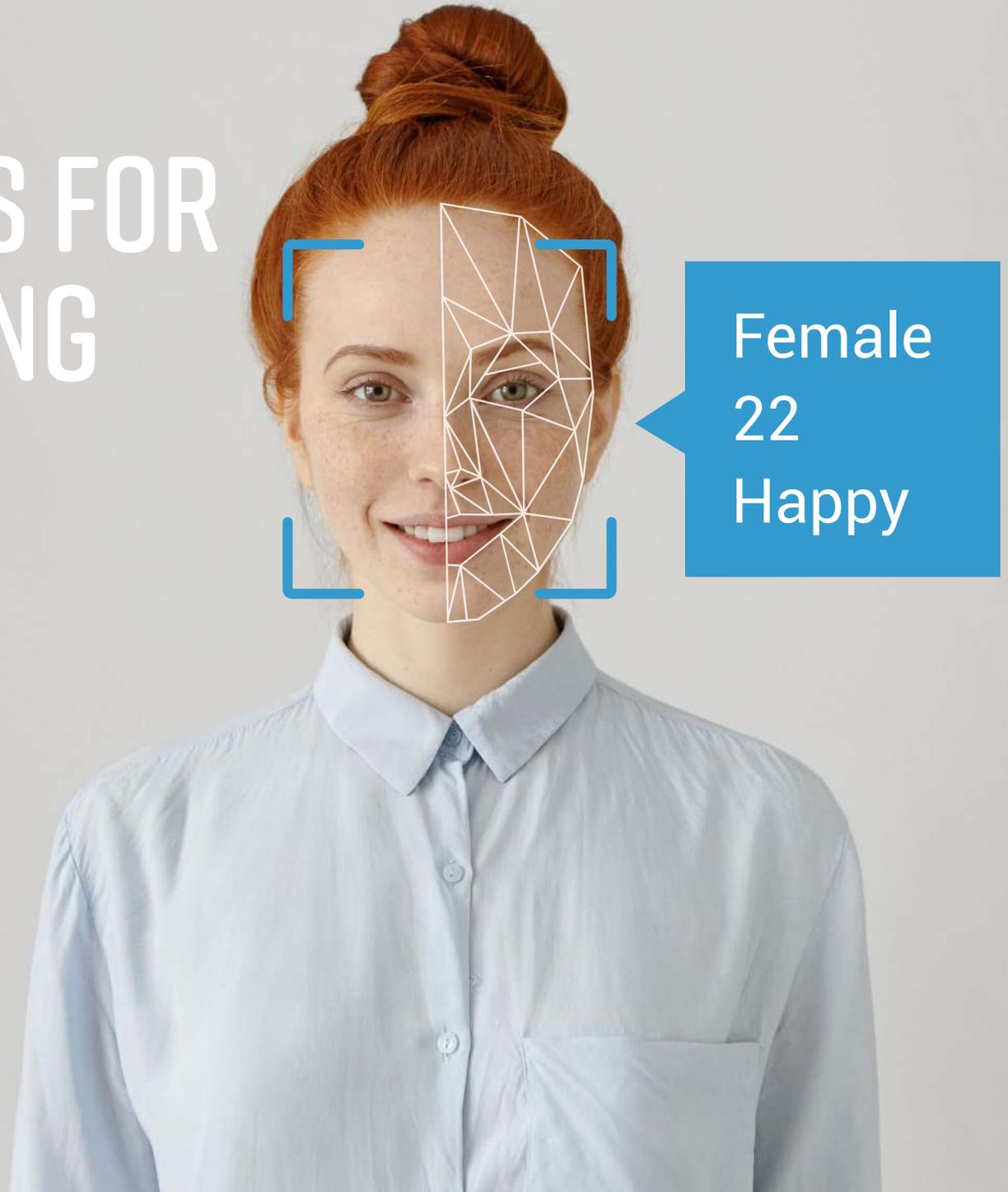


mediavalet

8 PRINCIPLES FOR IMPLEMENTING AI IN A DAM



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8 PRINCIPLES FOR IMPLEMENTING ARTIFICIAL INTELLIGENCE IN A DIGITAL ASSET MANAGEMENT SYSTEM

Artificial intelligence (AI) and machine learning have emerged in the marketing industry as a pathway to competitive advantage. The best marketers are identifying, evaluating and testing AI-driven applications to make better sense of their data, create personalized customer experiences and accelerate revenue growth. In fact, **84% of marketing organizations** either implemented or expanded AI and machine learning experiments and implementations in 2018.

For digital asset management (DAM), AI has brought the promise of automating one of the most time-consuming and manual processes in digital asset management – asset tagging. This is a process that’s been handled manually for years, taking hours of administration work to tag created content and make it easily discoverable for users.

Now, thanks to machine learning, AI can be used to auto-tag using general terms, like color, common objects and text recognition, and also be trained to address unique business cases. With this, thousands of assets can be processed in a matter of hours, rather than weeks.



QUESTIONS TO ASK BEFORE IMPLEMENTING AI IN A DAM

Before implementing AI in your digital asset management system, it's important to answer these three questions.

Do you have the capacity to implement AI?

While many organizations are tempted to jump right into AI, it's important to first understand if you even need it and, even more importantly, if you have the capacity to implement and manage the AI solution on an ongoing business. There are two critical considerations that will indicate your ability to effectively implement an AI solution into your DAM:

Data maintenance

In order to have an intelligent and accurate system, you need to commit to maintaining the library's data quality as you implement AI. The time commitment required will differ for dynamic and standard features, varying from full model training to maintenance and fine-tuning.

Cost

The cost of using AI services is often transactional and based on the amount of data being processed. It's important to understand the amount of assets you expect to analyze, and to anticipate future growth.

While these two considerations don't entirely dictate your capacity for an AI solution, they are important to evaluate before making any decisions.

Which vendor should you use?

Leading organizations like Microsoft, Google and Amazon all offer **Machine-Learning-as-a-Service (MLaaS) solutions**, which allow users to enable the auto-tagging of their digital media using:



Image Analysis



Common Object Recognition



Face Recognition



Landmark Detection



Product Search



Speech Recognition



Brand/Logo Detection



Optical Character Recognition



While each vendor provides machine learning services, their approach and offerings may differ. With this in mind, it's important to enter vendor conversations with an understanding of your own needs, so you can properly evaluate vendors based on your use-cases.

Here's a table highlighting a few vendors' basic package offerings. While they're similar in most cases, some capabilities are limited to just a couple vendors. For example, if one of your primary business use-cases was

based on facial recognition, you would likely narrow your selection to Microsoft Azure Computer Vision or Amazon Rekognition.

Feature	MS Azure Computer Vision	Google Cloud Vision	Amazon Rekognition	IBM Watson Visual Recognition	Clarifai
Face Detection	✓	✓	✓	✓	✓
Face Recognition	✓		✓		
Facial Landmarks	✓	✓	✓		
Feature Detection	✓	✓	✓		✓
Similar Faces (face search)	✓		✓		
Sentiment Detection (Faces)	✓	✓	✓		
Object Detection (Labels)	✓	✓	✓	✓	✓
Landmark Detection	✓	✓		✓	✓
Celebrity Recognition	✓		✓		
Logo Detection		✓	✓		
OCR	✓	✓	✓	✓	✓
Nudity/Violence Detection (NSFW)	✓	✓	✓	✓	✓
Image Analysis	✓	✓	✓	✓	✓
Video Analysis	✓	✓	✓		



What level of customization do you require?

There are 3 primary levels of AI customization (MLaaS) to choose from:

- Packaged MLaaS
- Guided MLaaS
- Specialized MLaaS

Selecting which one is right for you will depend on your use-case, understanding of AI and budget. As your AI solution becomes more custom, it will require more expertise in machine learning and a greater undertaking to your organization, both in work and budget.

Generally speaking, most organizations typically adopt a Packaged MLaaS solution to resolve the majority of their tagging challenges and add a Guided MLaaS solution to resolve any additional business use-cases. Only highly specialized organizations and use-cases require a Specialized MLaaS solution, as they represent a significant resource commitment.

Packaged MLaaS

Packaged Machine-Learning-as-a-Service is the lowest level of MLaaS customization.

In this level, the provider equips you with a packaged, ready-to-use model with a pre-defined set of artificial intelligence options, like facial recognition, object detection and text extraction. This is the easiest undertaking, as the AI-vendor is 100% responsible for providing the data, training, testing and deployment, so you don't need any machine learning skills to use it. Once connected with your library, you're able to start using the model immediately to tag your visual content.

Packaged MLaaS is used when an organization has a relatively basic AI use-case, where more generic auto-tagging terms are acceptable for their business.



EXAMPLE

A tourism company is uploading thousands of vacation photos to their media library every week. They don't have the time or manpower to manually tag the photos themselves, so they connect a Packaged MLaaS model to their library to auto-tag them.

Now, when they need an image for a honeymoon webpage, they can search for "Couple", "Beach" and "Sunset", and the library will return photos that have been automatically tagged by the Packaged MLaaS model.

Guided MLaaS

Guided Machine-Learning-as-a-Service is more complex and used to address specific business use-cases.

With this customization level, the machine learning vendor provides you with a space where you can classify your own media, adding images and tagging them appropriately to teach the model until you're satisfied with its confidence level. As you'll be providing the training and testing, you need to understand basic statistics and precision levels, so you can evaluate if the machine is at the right level of confidence.

This form of MLaaS is used if there's a business use-case that can't be satisfied using generic auto-tags.



EXAMPLE

A telecommunications company has a library to store visuals of the phones they offer. As they sell a variety of brands and generations of phones, the auto-tag "Cellphone" is too generic to make their visuals easily searchable. They decide to implement a Guided MLaaS model, so they can train the model to differentiate between the various brands and generations (such as an iPhone 8 or a Samsung Galaxy S9).

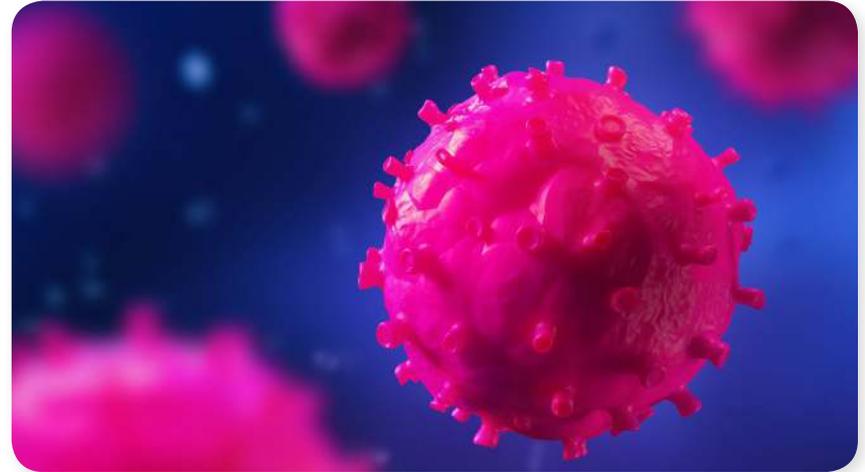
After training the model to a 99% confidence level, they connect it with their library so it can start auto-tagging newly uploaded visuals with the correct phone tags.

Specialized MLaaS

Specialized Machine-Learning-as-a-Service is the model that provides the most flexibility across tooling, platform and infrastructure, but also requires a full understanding of machine learning models and system integrations.

With Specialized MLaaS, the vendor provides you with a virtual machine that's prepackaged with standard machine learning software and add-ons, so that an internal IT team or 3rd party can code, train, package and deploy the model. In this case, you need to have a data scientist and a developer or technical integrator to provide the data, training, testing and deployment.

Specialized MLaaS is only used for very specific use-cases and requires the greatest resource investment of all the MLaaS models.



EXAMPLE

A pharmaceutical company is performing a scientific experiment that requires the identification and tagging of different strains of bacteria. As the differences between the bacteria are so slight and require advanced knowledge to identify, the company's use-case is too complex to be satisfied using Guided MLaaS. They hire a data specialist and programmer to build a fully-customized AI model using Azure Machine Learning Service.

After developing, training and testing the model, they can begin auto-tagging each specific strain of bacteria.

8 PRINCIPLES FOR IMPLEMENTING AI IN A DAM

Regardless of the vendor or levels of MLaaS you select, as you implement artificial intelligence (AI) into a DAM, you need to be careful to do so in a way that increases the value and applicability of asset metadata, so that ultimately your assets are more easily discoverable. Part of this is ensuring that your **cognitive metadata (AI-generated metadata)** can be isolated, tracked and audited easily.

Here are 8 key principles to consider when implementing AI-driven auto-tagging, to maintain the integrity of your metadata while improving the discoverability of your assets.

1. Cognitive Metadata Should Be Kept Separate

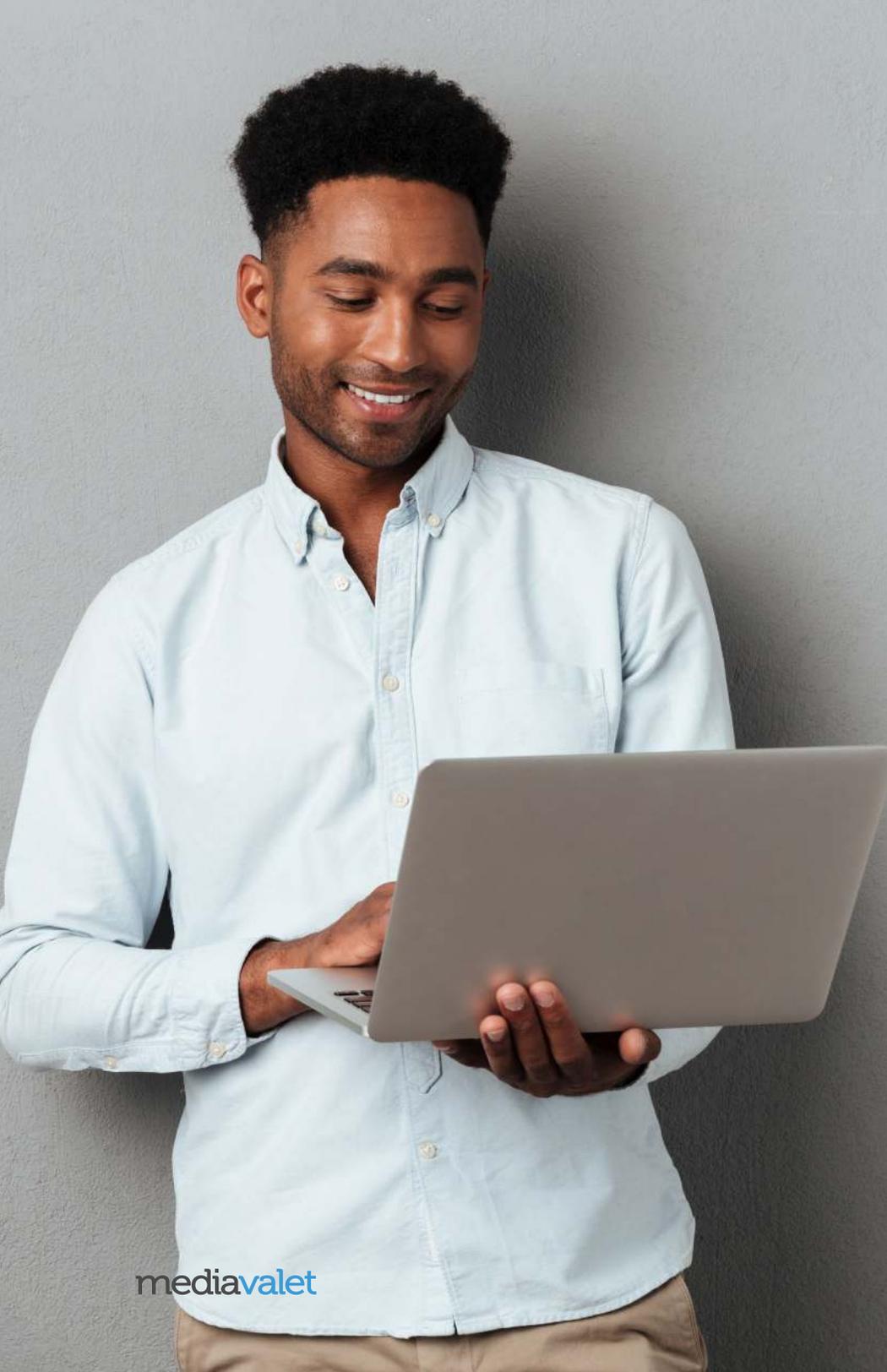
When implementing AI in a DAM, it's important to keep your cognitive metadata separate from your human-generated metadata.

When kept separate, you have the ability to control the availability of AI-generated metadata and enable your users to decide whether or not to use it in any given search. The primary purpose of this is to ensure that metadata derived from the AI service doesn't corrupt the quality of existing metadata.

This is especially helpful when you're piloting the use of a machine learning service, as you're able to see the quality of metadata being generated by the service before allowing other users to include them in their searches.

2. AI Providers Should be Tracked as a User

One of the primary benefits of a DAM is its ability to track actions taken by specific users, and AI should be no exception. Tracking your AI as a user allows actions performed to be more easily tracked and audited. This



becomes even more important if you plan on using multiple AI services.

For example, if you're using Microsoft Cognitive Services to generate certain metadata and Google Vision for others, by creating a user account for each you can better audit the output of the services, as you're able to isolate the metadata that was added by each service.

3. AI Services Should be Kept Separate

When implementing an AI service, it's important to separate your various services by project or feature, to better associate training data and test data with a particular attribute.

For example, if you create a test set for your AI service to identify phones, you would define a Cognitive Metadata Attribute called "Phones" to map to that corresponding AI project. You could also create a more general Cognitive Metadata Attribute called "Keywords" to associate with untrained auto-tagging features provided by a Packaged MLaaS solution.

Separating your services in this way allows you to transfer the data set to another service provider if you're not satisfied with the results of a feature.

4. Cognitive Metadata Should be Filterable

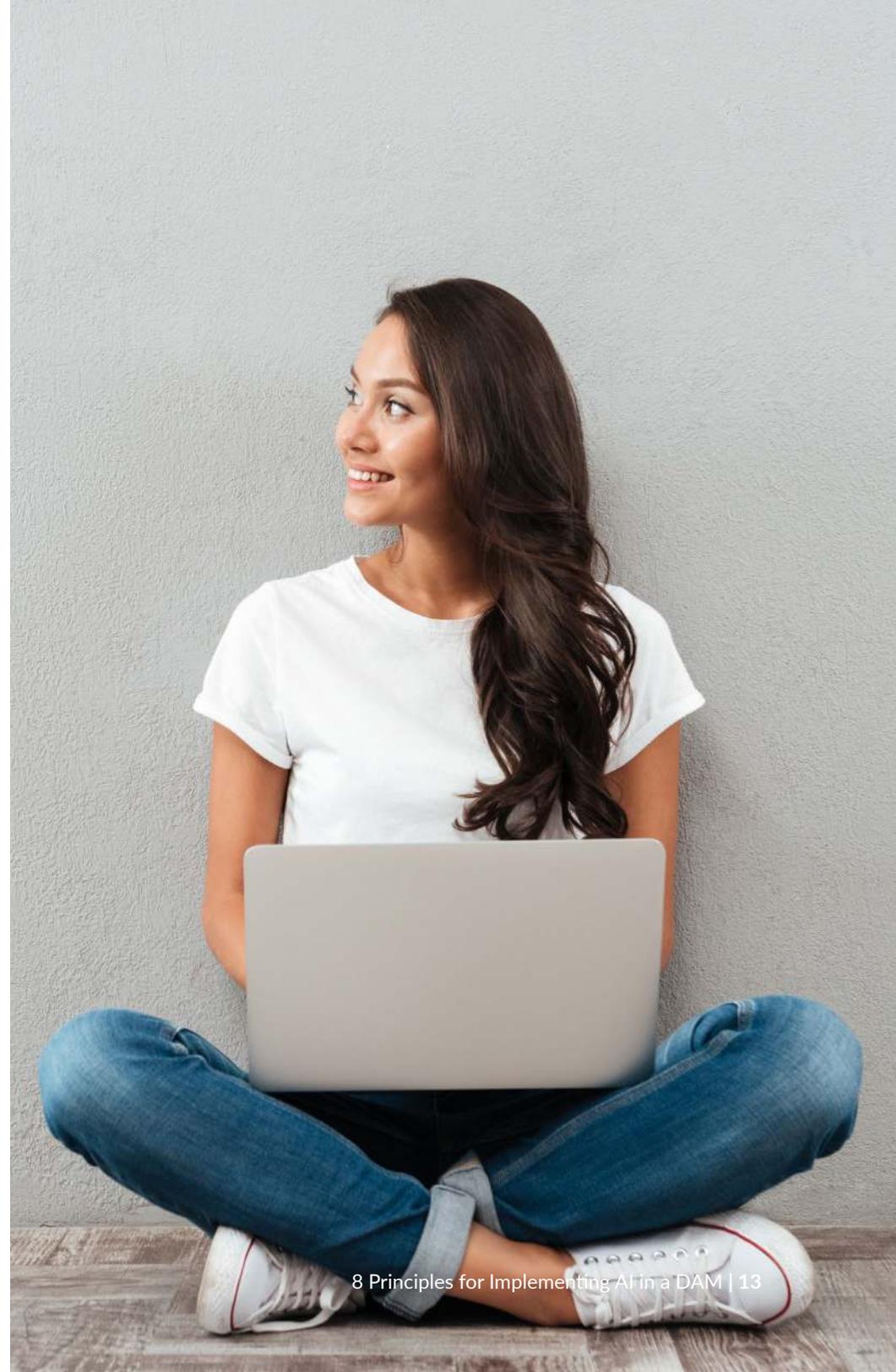
When using AI within a DAM, your users should be able to search for an asset based on AI-specific filters, such as AI provider, API/model version and prediction date. Users should also be able to increase or decrease the acceptable confidence level for any given search.

For example, a user could search using the keyword “Dog” and then filter it to only show results that were tagged using Microsoft Cognitive Services and have a confidence level of 95% or higher.

5. Cognitive Metadata Should be Convertible

Most DAMs allow embedded metadata to be converted to a regular asset attribute (such as a keyword); the same approach should be taken with auto-tags. When implementing AI into your DAM, consider setting rules so that if a tag is generated with a certain confidence level, it will automatically be converted into a general keyword (so it will still be available, even if user-access to AI services is toggled “off”).

For example, you can set up your AI with a set of rules so that any auto-tag with a confidence level of 99% or higher will be converted into a keyword.



6. Feedback Should be Used to Improve AI Output

AI models can progressively improve their performance on a specific task over time - as you gather more data, you're able to retrain the model and get better precision.

With this, any deleted/incorrect auto-tags should be treated as negative feedback and any confirmed auto-tags should be treated as positive feedback for the model. You can choose to retrain the model manually or it can be automatically triggered after a certain volume of asset data points has been collected by the DAM.



This principle is only applicable when you're using Guided or Specialized MLaaS, as it requires you to own the model and supply it with the "right information".

7. Cognitive Metadata Should be Versioned

As you update your models, assets that have already been tagged by an AI model in your DAM library should be re-analyzed, but you should still be able to access and track tags created by the previous model.

When you version and/or log your current and previous cognitive metadata, you're able to track how it's evolved and audit the efficacy of the new model.

8. AI Should Assist, Not Replace

Above all else, it's important to remember that AI is meant to assist, not completely replace the human aspect of tagging assets and still requires human validation to evaluate the levels of accuracy and relevance to the business.

This is because, while AI will help you achieve a majority of your tagging goals, it's still missing a key component - context. Manual verification and editing allow you to add business context to your assets, by removing, adding and altering keywords to satisfy various use-cases, ultimately making your assets more discoverable.

ARTIFICIAL INTELLIGENCE IS A JOURNEY, NOT A DESTINATION

Despite popular opinion, implementing artificial intelligence in your DAM is not as simple as flipping a switch, nor is it a one-step solution that will solve all of your digital asset tagging woes.

Artificial intelligence is a journey, not a destination. To truly make the most of auto-tagging and AI, you need to understand your use-cases and continuously adjust your models to better suit them.



ABOUT MEDIAVALET

MediaValet is a leader in cloud-based digital asset management that helps marketing and creative teams easily manage, collaborate on and distribute their digital assets and content, improving productivity and increasing the ROI on their marketing investments. With unlimited users, support and training, teams worldwide can access the content they need, whenever and wherever they need it.

Ready to Talk DAM and AI?

MediaValet provides artificial intelligence solutions customized to your business use-cases.

Start your AI implementation here

