



CEPIC 2026



Addressing Media Authenticity Challenges in Cultural Heritage with JPEG Trust

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Frederik Temmermans, Antonella Fresa, Philippe Rixhon, Paul Melcher



Authenticity of objects and places



Authenticity of an object or a place is ‘traditionally considered as linked to its (historical) provenance and materiality, authenticated by some authoritative individual or organization, focusing on heritage conservation.

However, this approach poses a range of questions in the cultural heritage domain, e.g.:

- May rebuilding considered an authentic practice bringing to new authentic heritage?
- Wars, natural disasters, social and urban changes impact on the durability of original heritage places and artifacts that are transformed
- Meaning and value attributed to heritage can change over time

A variety of perspectives apply to the concept of authenticity of heritage places and objects.



Authenticity of the cultural experience



With the advent of the techniques for the fruition of cultural heritage in digital form, the cultural experience extends to a context of mixed reality.

Consequently, the question of authenticity extends from the assessment of the **digital representation of the cultural object** to the assessment of **the extended reality**.

Heritage authenticity refers to the file(s) where the object is represented in digital form, but it deals also with the capacity of complex digital applications to enhance the visitor's engagement within an authentic heritage experience.



XR and cultural heritage



The question is how the visitor's perception of authenticity changes when Extended Reality (XR) experiences are introduced in cultural heritage, **how visitors interact with cultural heritage sites and artifacts.**

Instead of a direct interaction with heritage, the engagement is mediated by a digital representation of the heritage, which extends the reality through Augmented Reality (AR) apps, Virtual Reality (VR) experiences and Mixed Reality (MR) environments.

The concept of authenticity expands **from originality and materiality to a wider framework** that recognises also the subjective nature of the visitor's experience.





Digital twins and Memory twins



In the cultural heritage sector, digitisation plays a double role:

- To generate the '**digital twin**' of the physical object, including geometrical features, colors of the texture, descriptive metadata and paradata about the techniques, equipment and environmental conditions used during the digitisation
- To provide the representation of a '**memory twin**' in digital form, combining the digital twin with the contextual information of the cultural object, such as historical, artistical and critical documentation linked with the actual object

Heritage between conservation and experiences

While heritage conservation looks at authenticity from the perspective of the object (which poses already questions), heritage experience takes into account also the person who interacts with an object or a place from his/her own individual perspective (which poses further questions).

The EUreka3D-XR project has experimented the reuse of 3D cultural contents in three different contexts of XR heritage experiences:

GIRONA (CAT)

The virtual visualisation of the middle-ages walls of the city of Girona.



BIBRACTE (FR)

The AR narrative of the hidden side of the Bibracte archaeological site.



PAPHOS (CY)

The creation of a new life of Saint Neophytos Englystra in Cyprus in the virtual space.



GIRONA (CAT)

The virtual visualisation of the middle-ages walls of the city of Girona.



The 3D models of the walls of Girona have been created by training an AI tool with:

- Materials from the city archive (documents, pictures, videos, interviews)
- Videos taken with a drone

Questions about authenticity:

- How much these ‘artificial’ 3D models of towers and bastions are authentic?
- How can the AR tour in Girona become an authentic cultural experience?

BIBRACTE (FR)
The AR narrative of the hidden side
of the Bibracte archaeological site.



The 3D models of the archaeological site of Bibracte come from two sources:

- High-quality digitisation of relicts exhibited in the museum
- 3D modelling created with CAD on the basis of historical studies
- Questions about authenticity:
 - How to avoid a ‘disneyalisation’ of the visit of the site
 - Is the positioning of the digital replica of the artefact in the ‘point of interest’ of the site **authentic?** (missing to tell about the environment where the archaeological artifact was found, scientific questions about the artefacts, conditions of use at the time, etc.)

PAPHOS (CY)

The creation of a new life of Saint Neophytos Englystra in Cyprus in the virtual space.



The high-quality digitisation:

- The 3D model of the cave
- The 2D digitisation of the frescos
- The reproduction of the Saint as a talking avatar
- Questions about authenticity:
 - How to monitor the quality of the narrations included in the VR
 - Is the avatar of a medieval monk an authentic heritage experience?

valunode

Streamlining the exchange of rights data to boost the **value** of creation and solve the infringement tsunami that GenAI has created





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Research

- Copyright and new technologies
- Mapping databases and metadata standards
- Interconnecting existing data repositories
- Identity and digital signatures

Standardisation

- ISO/JPEG Trust
- ISO/ISCC and other methods for binding media and metadata
- C2PA and CAWG
- IPTC and W3C ODRL

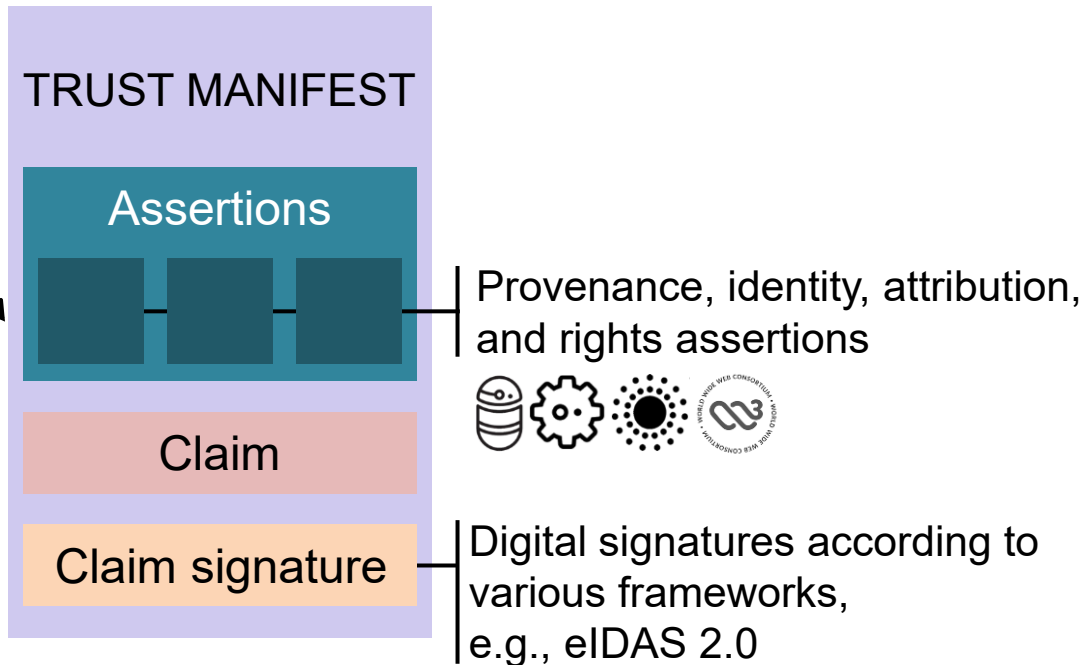
Development: Copyright Data Exchange

Trust manifest and binding



Binding
& protocol

IMATAG
ISCC



Watermark-and-fingerprinting-based declaration and discovery protocol

VNote

- who
- what
- where*

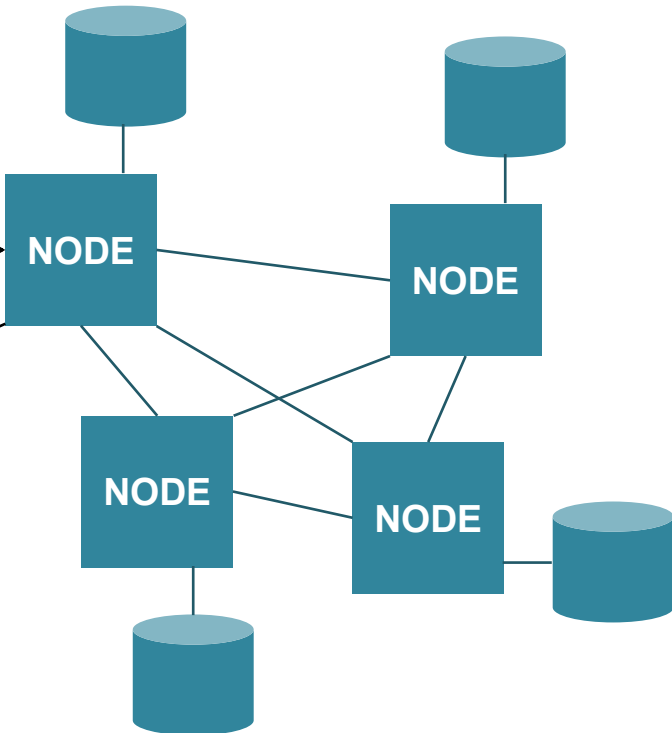
declaration event

VID (identified VNote)

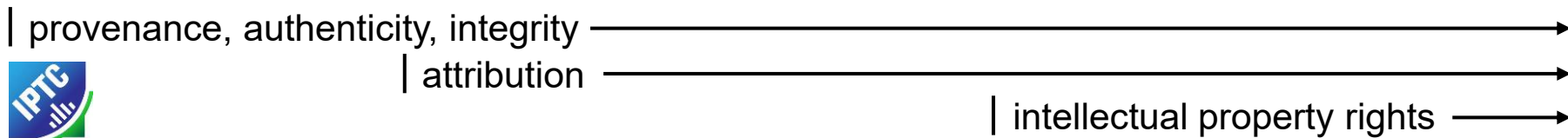
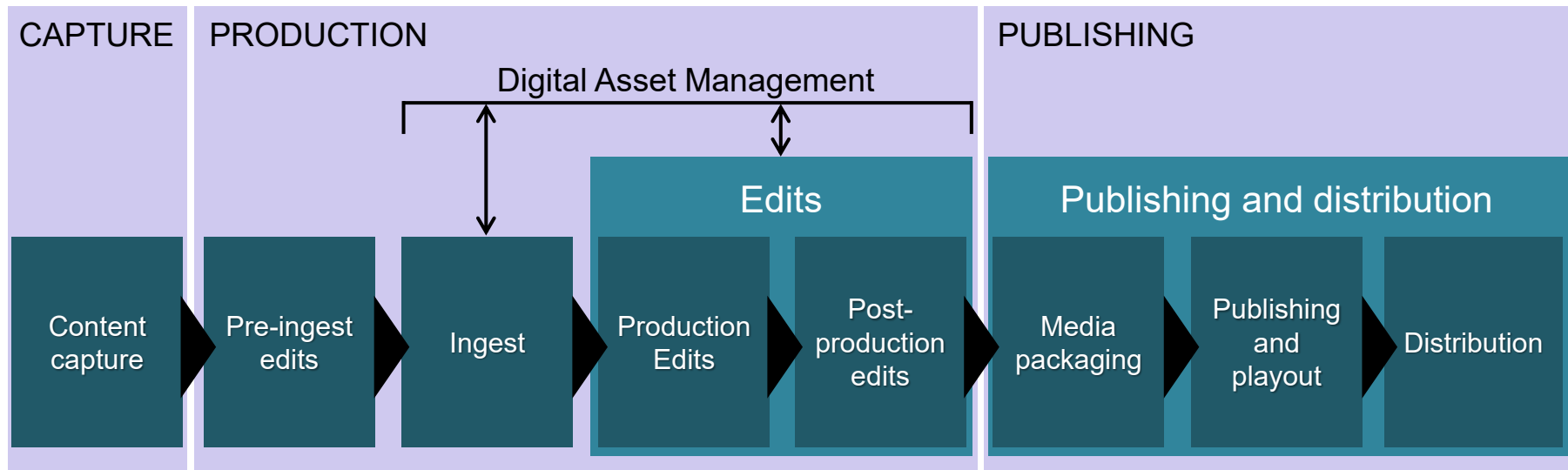
- 52-bit ms timestamp
- 12-bit NODE-ID

W3C **Controlled IDentifier**

when



*: address of the trust manifest



AI legislation

EU AI Act

California AI transparency Act

IMATAG

The foundation of visual trust

Our Story



Patent & Foundation

2015

Our company was founded by experts in Digital Watermarking and Visual recognition from the renowned french research institute INRIA.

Inria



IMATAG



Recognition & growth

2017

IMATAG's patented watermark is quickly recognized as a beneficial alternative to established providers by a demanding community of photographers and industrial users.



PetaPixel



The company today

2026

Main investor : Aday (Media watch)
13 partners
60+ top B2B references worldwide
in various verticals

AFP

SAMSUNG



IMATAG

100+
clients
worldwide

500M

watermarked assets
monitored across the
internet and print

7M

articles found
with watermarked
image

1,2M

web sites
containing
watermarked image

10

Years Strong
Trusted by Industry

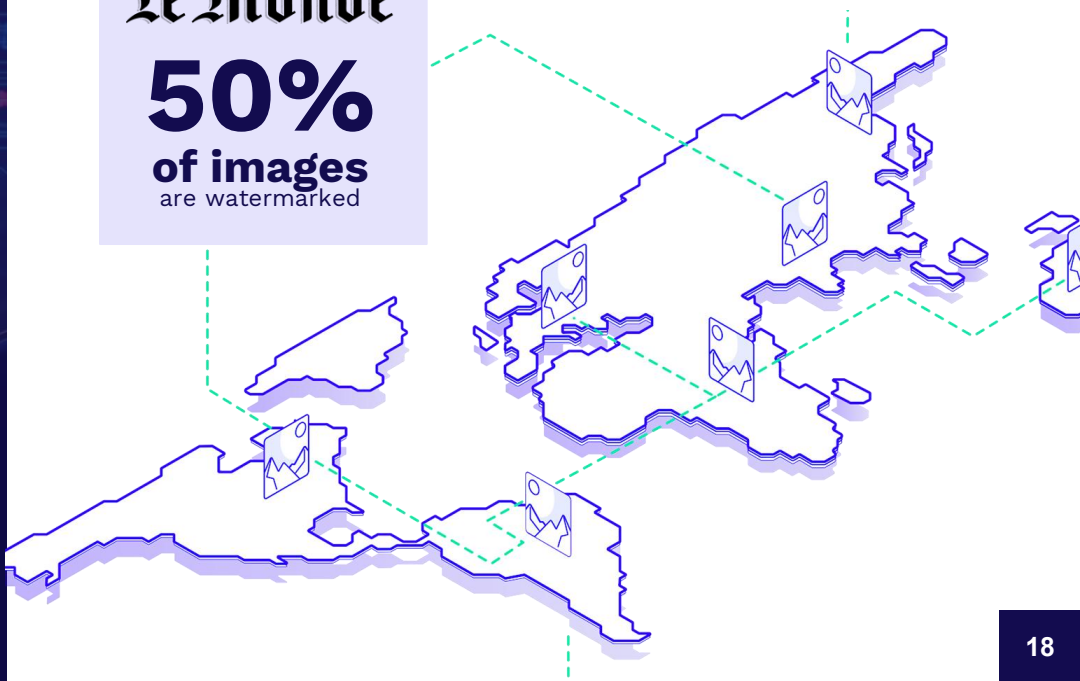


A benchmark
in the press/media
industry

Imatag today

Le Monde

50%
of images
are watermarked



85%

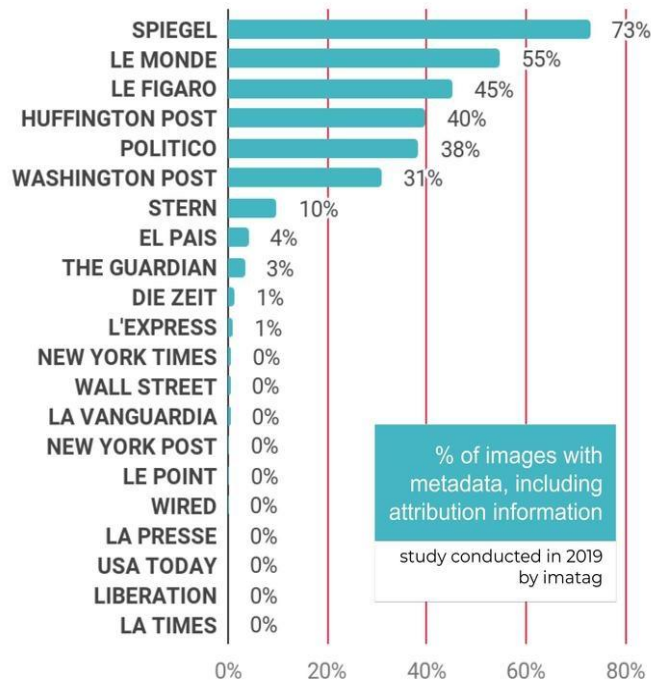
of images published
on the web have no
metadata

imatag[®] study

IPTC
EXIF
XMP



METADATA STUDY ON 21 NEWS WEB SITES IN EUROPE AND NORTH AMERICA





We need a solution that stays with the content

regardless of what happens to the file.



It must:

=> Survive edits, crops, and compression.

=> Work even when the "official" labels are stripped.

=> Act as the persistent link between the pixels and the proof.



Something like that



The foundation of trust

by creating an indelible link to the original image:

Invisible watermark (embedded in the pixels)

- Survives cropping, resizing, recompression
- Independent of metadata
- Machine-readable



Reconnects to:

- Original asset
- Authentic metadata
- Provenance history
- Usage rights
- Content credentials

How invisible watermarking completes C2PA and IPTC

IPTC

identity at the source

C2PA

the tamper-evident record

IMATAG

the link that survives

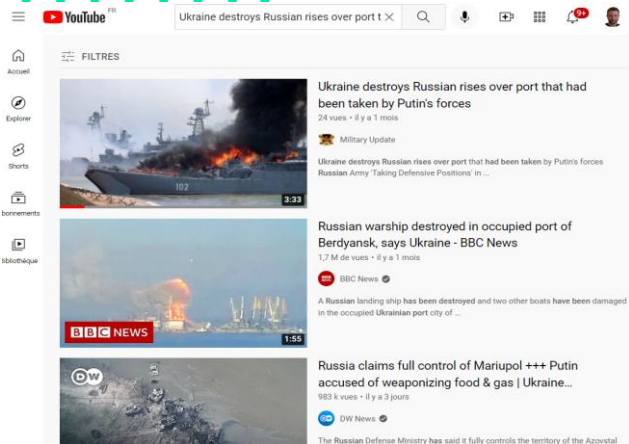
The declaration.

The chain of custody.

The thread that holds it all together.

Metadata declares. Credentials prove. **Watermarking keeps the proof attached.**

A Youtube case on a Russian warship



Input image



Upload suspect file

Original file



watermarked - certified by Imatag

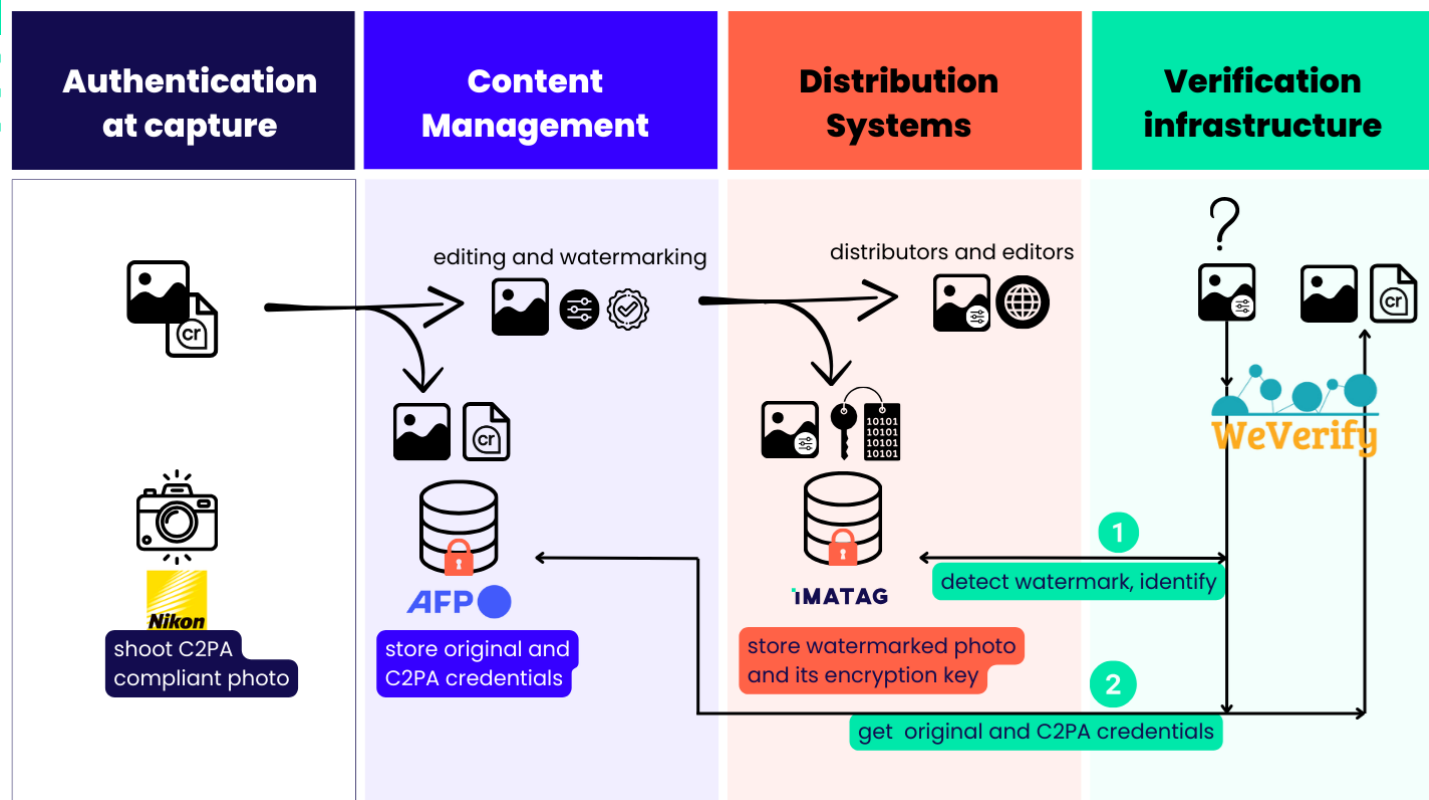
file: AFP_98J3M8

watermarking date: 22/04/2021

provider: AFP

description: This handout picture released by the Russian Defence Ministry on April 22, 2021, shows Russian forces landing a shore during a military drill along the Opuk training

AFP Nikon Imatag



The screenshot shows a web browser displaying an article on the Lifestyle Asia website. The browser's address bar shows the URL: `lifestyleasia.com/hk/culture/people/everything-to-know-about-barron-trump/`. The website header includes the Lifestyle Asia logo with the tagline "YOUR ACCESS TO THE GOOD LIFE" and a navigation menu with categories: WHAT'S ON, DINING, STYLE, ENTERTAINMENT, CULTURE, LSA30, ASTROLOGY, BEAUTY & GROOMING, TRAVEL, and TECH. A "Subscribe" button and a location selector set to "HK" are also visible.

The article's breadcrumb trail is: Home > Culture > People > Everything you need to know about Barron Trump, the youngest and tallest Trump.

The article title is "Everything you need to know about Barron Trump, the youngest and tallest Trump", written by Manassen Gupta. It was published on January 23, 2025, at 03:30 PM HKT, with an 11-minute read time. A "Add as a preferred source on Google" button is present.

The main image shows Barron Trump in a dark suit and blue tie, waving. A woman is partially visible in the background.

Below the image, the text begins: "When Donald J. Trump was inaugurated as the 47th President of the United States on 20 January 2025, the cameras and those in attendance frequently turned their attention to a towering figure in the gathering — Barron William Trump."

On the right side of the page, there is a newsletter sign-up form with the text: "Sign up for our newsletters to have the latest stories delivered straight to your inbox every week." It includes a text input field for an email address, a checkbox for "Yes, I agree to the Privacy Policy", and a yellow "SIGN UP" button.

Below the sign-up form is a "Most Popular" section. The first item is titled "Asking the LSA HK team their 2026 New Year's resolutions" under the "CULTURE" category, published 16 hours ago with a 5-minute read time. The second item is "CEO Kristian Teär speaks on 100 years of Bang & Olufsen" under "CULTURE", published 2 weeks ago with a 6-minute read time.



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paul@imatag.com