La digitalizzazione della formazione con smart glasses

L'impatto dell'Industria 4.0 sulla gestione del controllo e della sicurezza alimentare

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The datafication of training by smart glasses

The impact of Industry 4.0 on food safety & quality management and control

Abstract

Datafication is a pervading practice that is transforming human relationships and practices when mediated by smart technologies. In the case of food production and stocking safety audit and conformity assessment, the impact of smart glasses on innovating the way controls are being conducted is just the tip of the iceberg about industry 4.0 conversion of the whole workflow of production. In an IoT (Internet of Things) framework, machines, sensors, databases, internet connections, georeferencing applications, and many others act in networks as much as human experts do. So, about the food industry is not a matter of innovating how control is conducted, but to adopt a lean management in a digital world perspective on the whole process.

Smart glasses can be useful for mixed reality, as users can see augmented places with data and interact with digital and physical objects; moreover experts can see from remote what users see and provide troubleshooting solutions, and increase the level and quality of control by comparing what smart glasses see and what smart machines (freezers, packaging machines, thermometers, and more) provide as data. Participants will provide feedback on some questions. Do you think this will happen? Can this substitute or integrate the role of humans? What are the pros and cons? What are the consequences for training and expertise development for audit and control management?

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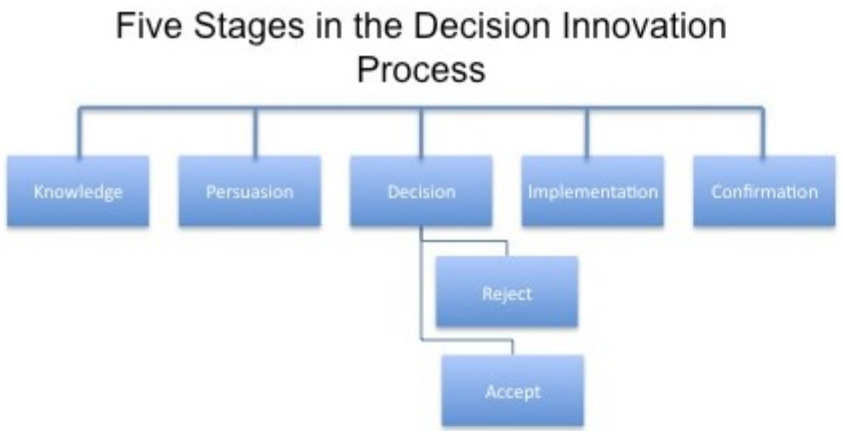
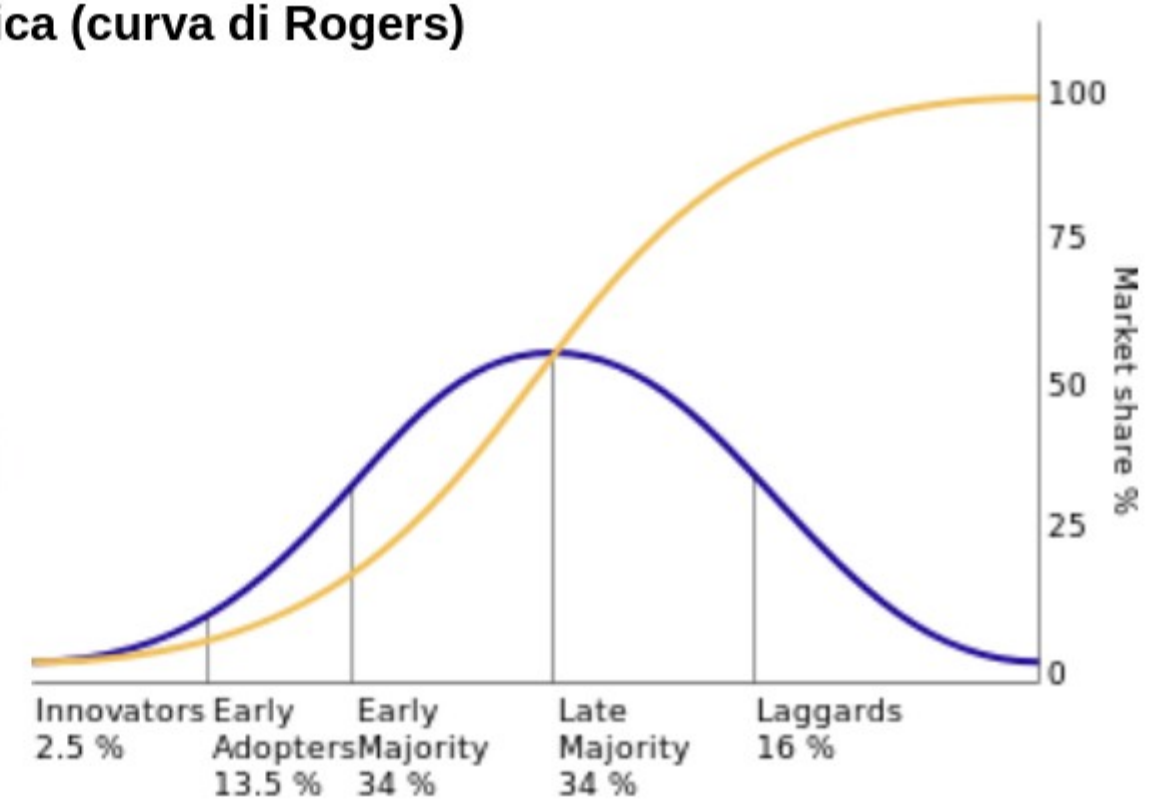
Parleremo di….

…come l'Industria 4.0 possa impattare
con Smart Glasses (da ora SG)
sulla pratica professionale
e quindi sulla formazione

Le 5 fasi di adozione come processo decisionale di innovazione tecnologica (curva di Rogers)





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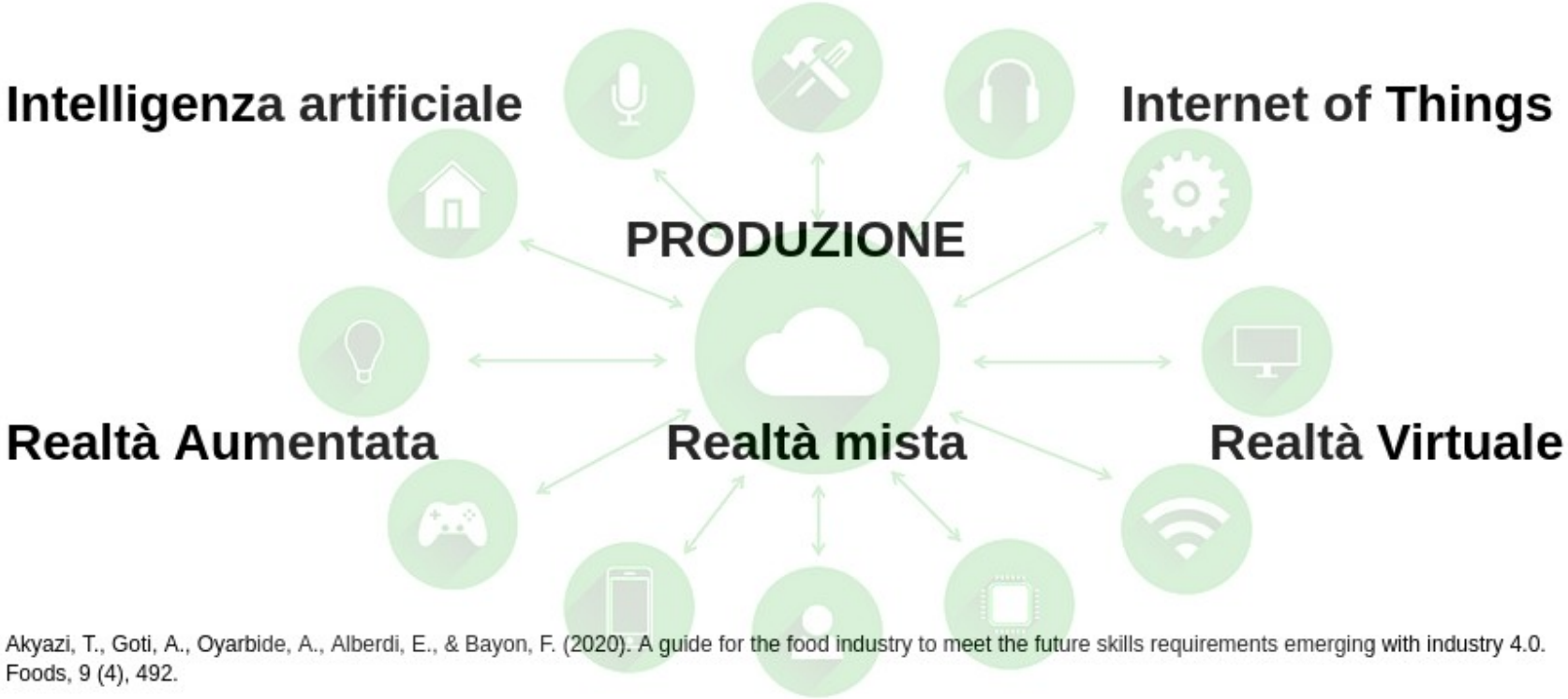
Cyber-Physical Systems

"The term cyber–physical systems (CPSs) refers to combinations of software, mechanical, and electronic physical machines that are connected via networks to create larger ensembles of distributed complex systems. CPSs are created in heterogeneous areas such as smart grids, eHealth, assistance systems for the elderly, and industrial production. The latter field forms the central basis of the political program coined Industrie 4.0, which was presented officially at the Hannover Fair in 2012 in Germany" (Pfeiffer at al., 2016).

T. Pfeiffer, J. Hellmers, E. Schön and J. Thomaschewski, "Empowering User Interfaces for Industrie 4.0," in Proceedings of the IEEE, vol. 104, no. 5, pp. 986-996, May 2016, doi: 10.1109/JPROC.2015.2508640.

Cosa è l'Industria 4.0?



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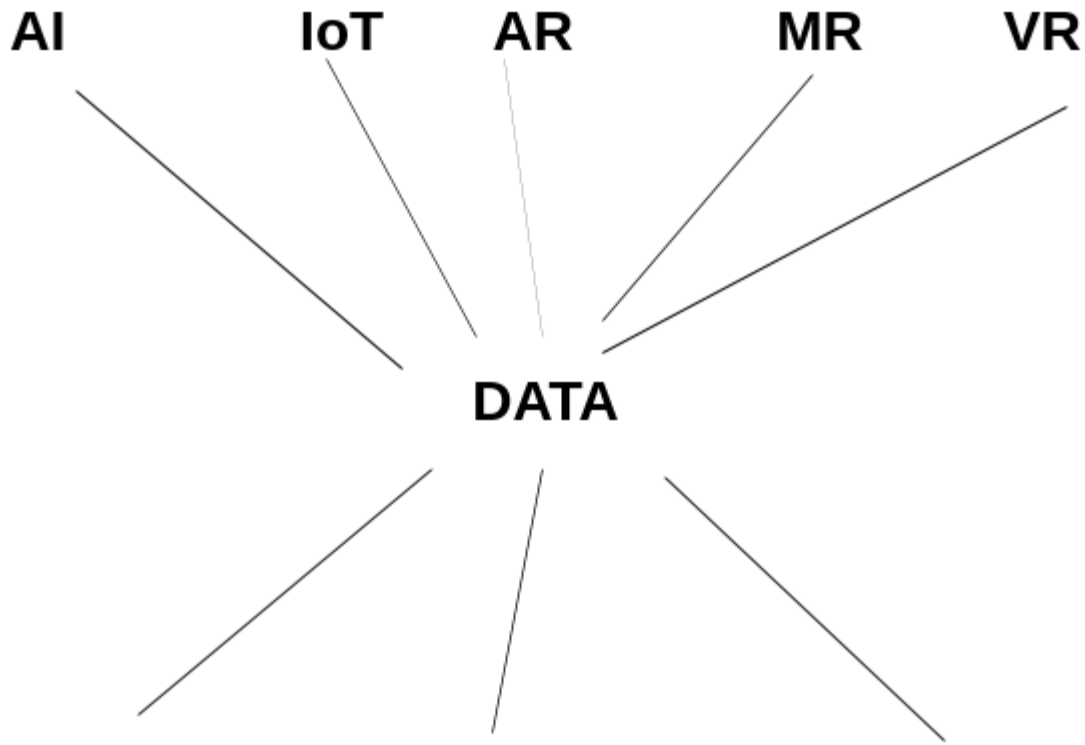

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Porter, Michael E., and James E. Heppelmann. "Why Every Organization Needs an Augmented Reality Strategy." *Harvard Business Review* 95, no. 6 (November–December 2017): 46–57. https://hbr.org/2017/11/why-every-organization-needs-an-augmented-reality-strategy

"Smart Glasses"

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Adozione di SG sul…campo

L'uso di SG per realtà aumentata in agricoltura e zootecnia per visualizzare informazioni relative alle colture, animali, macchinari o materie prime e fornire dati e guida in tempo reale tramite videochiamate.

Caria, M., Sara, G., Todde, G., Polese, M., & Pazzona, A. (2019). Exploring Smart Glasses for Augmented Reality: A Valuable and Integrative Tool in Precision Livestock Farming. *Animals : an open access journal from MDPI*, *9*(11), 903. https://doi.org/10.3390/ani9110903

Gli SG potrebbero essere utilizzati anche nel sistema di monitoraggio della guida dei mezzi agricoli in cui layers di informazioni georeferenziate si sovrappongono al campo visivo dell'agricoltore per acquisire dati sul terreno e diverse zone da trattare.

Santana-Fernández, J., Gómez-Gil, J., & del-Pozo-San-Cirilo, L. (2010). Design and implementation of a GPS guidance system for agricultural tractors using augmented reality technology. *Sensors (Basel, Switzerland)*, *10*(11), 10435–10447. https://doi.org/10.3390/s101110435

Le applicazioni VR continueranno a essere sviluppate sia per la produzione che il consumo alimentare.

Gere, A., Bin Zulkarnain, A. H., Szakál, D., Fehér, O., & Kókai, Z. (2021). Virtual reality applications in food science. Current knowledge and prospects, *Progress in Agricultural Engineering Sciences*, *17*(1), 3-14. Retrieved May 18, 2022, from https://akjournals.com/view/journals/446/17/1/article-p3.xml

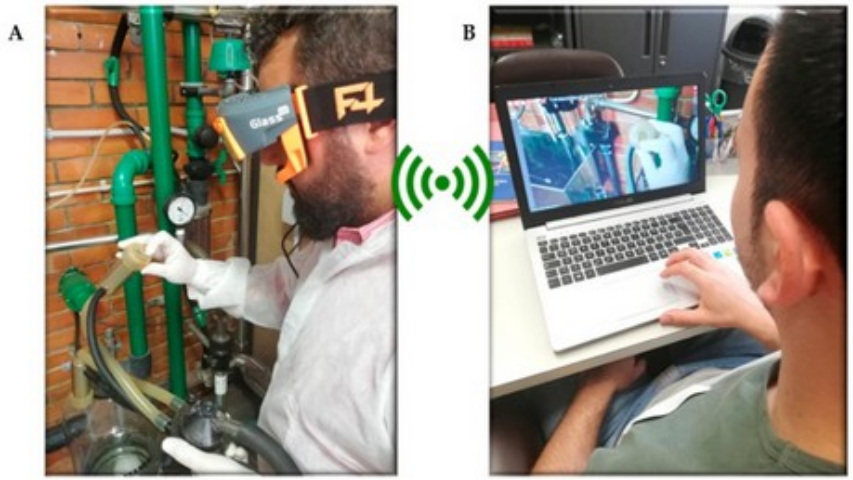
Gli SM possono essere utilizzati anche per migliorare l'agricoltura di precisione soprattutto in serre e aquacolture servite da IoT. I dati potrebbero essere sovrapposti a oggetti reali, consentendo la visualizzazione dello stato delle piante (crescita, malattie, umidità, etc…).

Phupattanasilp, P., & Tong, S.-R. (2019). Augmented Reality in the Integrative Internet of Things (AR-IoT): Application for Precision Farming. *Sustainability*, *11*(9), 2658. https://doi.org/10.3390/su11092658

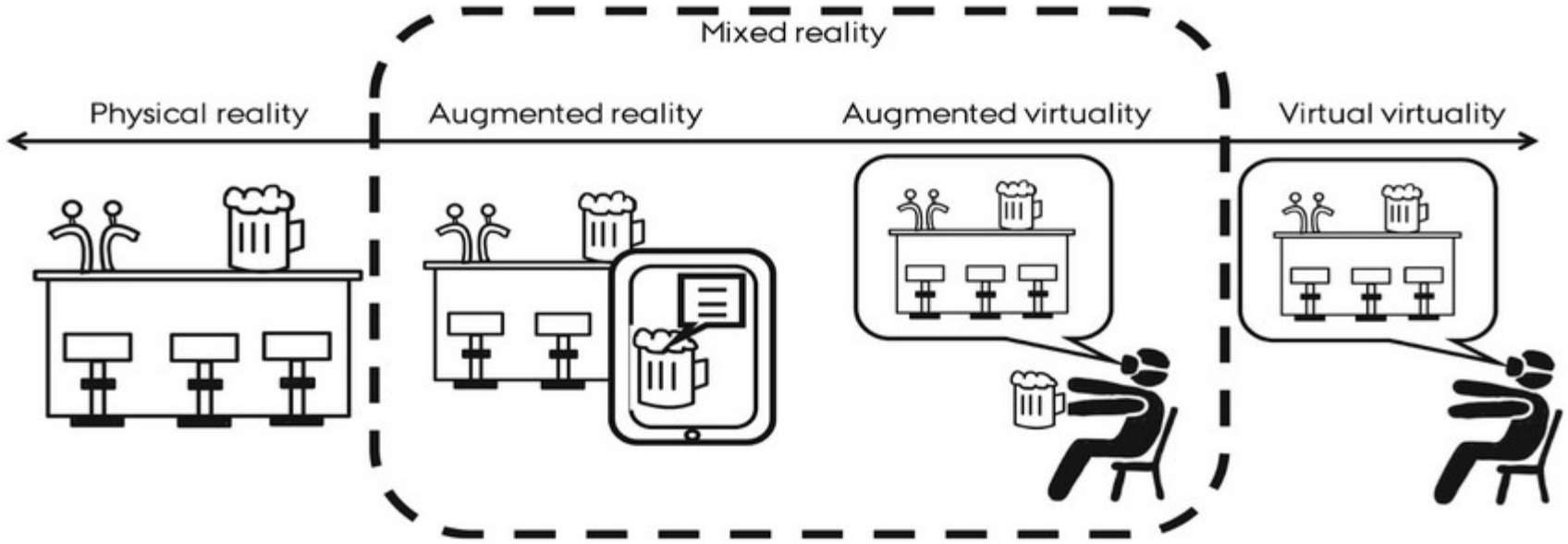
M. Xi, M. Adcock, J. McCollouch An end-to-end augmented reality solution to support aquaculture farmers with data collection, storage, and analysis Proceedings - VRCAI 2019: 17th ACM SIGGRAPH international conference on virtual-reality continuum and its applications in industry (2019), 10.1145/3359997.3365721

Anche la formazione dei dipendenti della ristorazione può essere potenziata. Gli SM sono utili per l'allenamento e coinvolgimento dei dipendenti nel processo di formazione, migliorando le loro capacità professionali e di *problem solving*.

Clark, J., Crandall, P., & Shabatura, J. (2018). Wearable Technology Effects on Training Outcomes of Restaurant Food Handlers. *Journal of food protection*, *81*(8), 1220–1226. https://doi.org/10.4315/0362-028X.JFP-18-033



L’applicazione del virtuale al consumo alimentare



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Q. Wang, C.S. Beverages Assessing the influence of the multisensory atmosphere on the taste of vodka 2015, undefined Mdpi.Com, 1 (2015), pp. 204-217, 10.3390/beverages1030204

IL FATTORE PANDEMIA!

Un caso d'uso emerso nel settore della sicurezza alimentare è quello delle ispezioni a distanza e auditing. A causa della pandemia di COVID-19, le restrizioni di viaggio e le procedure di blocco hanno ostacolato il movimento degli organismi di certificazione alimentare per condurre audit e controlli normativi in loco e rilasciare certificazioni agli attori della filiera. I professionisti hanno avuto difficoltà a viaggiare, condurre controlli e confermare la conformità per garantire la coerenza dei sistemi di sicurezza alimentare. Oltre ad adottare soluzioni ad hoc innovative è necessario sviluppare la ricerca e integrarla nell'indotto dell'innovazione nell'ambito agroalimentare.

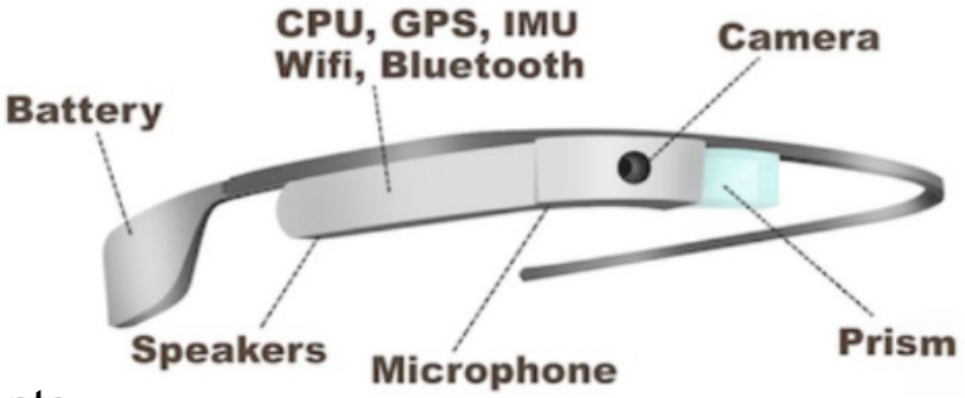
Rejeb, Abderahman & Keogh, John & Rejeb, Karim. (2020). COVID-19 and the Food Chain? Impacts and future research trends. Logforum. 16. 475-485. 10.17270/J.LOG.2020.502.

I possibili livelli di analisi di impatto del fenomeno e ricadute sulla formazione

- Organizzativo (Porter & Heppelmann, 2017)
- Ricerca sull'aumento della qualità con l'adozione degli smart glasses (Rejeb, Keogh, Leong, and Treiblmaier, 2021)
- Valutazione dei rischi (Hein & Rauschnabel, 2016; Feng & Mueller, 2019)
- Percezione sociale e popolarità del fenomeno maggiore rispetto alle applicazioni utili documentate (Kohn & Harborth, 2018)
- Il bisogno di ricerca mirata all'area della digitalizzazione dell'industria alimentare nella letteratura scientifica (Demartini et al., 2018)
- Impegno per risolvere ostacoli per mantenere la competitività e esigenze di sicurezza e qualità (Rejeb, Rejeb, & Keogh, 2021).

Conclusioni

- informazioni contestualizzate come formazione situata
- assistenza e formazione a mani libere
- formazione potenziata e comunicazione visuale
- documentazione visiva a pronta consultazione
- migliore tracciabilità dei processi dell'apprendimento
- maggiore numero di utenti coinvolti (formatori, esperti, stakeholder, clienti e discenti)
- maggiore standardizzazione del flusso di lavoro (e conseguente regolamentazione)



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