

Content Types That Drive Engagement with Semi-Public Information Radiators

A Longitudinal Study of Interaction Logs

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Abstract. Information radiators in workplace environments display content from enterprise systems in semi-public spaces to support serendipitous discovery. However, display blindness can limit user engagement with such devices. This paper investigates how different content types influence engagement with an established workplace information radiator application, the CommunityMirrors. Three content types are distinguished: People, Organizational Units (Org Units), and Artifacts. A quantitative analysis of interaction logs was conducted over three months before, during, and after a lightweight two-step intervention consisting of a display-based poster prompting profile updates and a follow-up email to employees, thereby highlighting the People items. Results show that the People items exhibited the highest baseline interaction rates but did not sustain increased engagement following the intervention. In contrast, Org Unit and Artifact items demonstrated increases in the interaction rates over time. These findings reveal that engagement trajectories differ by content type and that interventions may redistribute attention across content types rather than amplify attention to the targeted content. Consequently, content managers and researchers can design engagement strategies for semi-public information radiators more precisely.

Keywords. user engagement, information radiator, semi-public, office environment, CommunityMirrors, evaluation, content types

1 Introduction

Various enterprise collaboration platforms have been introduced to preserve and distribute internal enterprise information. Ubiquitous technologies enable enterprises to share such information apart from the personal workspace – e.g., using large information radiators (Cockburn, 2001), which replace traditional bulletin boards and expose often-hidden knowledge in (semi-)public areas (Koch, 2025). These tools preselect information objects from enterprise collaboration platforms and display them without being actively queried, with the intention of distributing the content and enabling serendipity, a notion of making unplanned discoveries that are valuable and expand our way of thinking (Busch, 2024; Hannan, 2006; Roberts, 1989). To enable such a discovery, employees must engage with the information radiators. However, display blindness is a barrier that prevents engagement with such devices (Huang et al., 2008; Memarovic et al., 2015; Müller et al., 2009). To overcome display blindness, our research examines different content types and how users engage with them, with a particular focus on

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person-related content, which was temporarily highlighted through a lightweight intervention to assess whether engagement patterns can be influenced. This work analyses the potential of different content types to engage users and, as a consequence, explore various content displayed by information radiators. In this regard, we in particular focus on these two research questions:

- RQ1: How does user engagement (interaction rate) differ across content types on workplace information radiators?
- RQ2: How does a lightweight awareness intervention affect the interaction rates across content types over time (short-term and sustained effects)?

These insights are relevant for designers and operators of collaboration platforms and information radiators in workplaces, as well as researchers in Computer-Supported Cooperative Work (CSCW), who must decide how to balance content types and whether targeted nudges can sustainably influence engagement patterns.

The following section first reviews related work, introducing key terms, relevant barriers to enterprise collaboration platforms, and existing studies on the impact of content types on interaction rates. We then present the quantitative approach used in this work and the results of the study, which, overall, answer our research questions. Then, we summarize the limitations of our study. Finally, the results are discussed, and a conclusion summarizing the implications and contributions of this work is drawn.

2 Related Work

Large information radiators are ubiquitous multi-user interfaces proactively displaying content from collaboration systems beyond the confines of the classical desktop computer (Koch, 2025). They present information that is not explicitly sought but may be interesting to users (Koch et al., 2014) to foster serendipity (Busch, 2024; Hannan, 2006; Roberts, 1989). In semi-public areas, such information radiators are typically located in corridors, coffee corners, etc., and are accessible to several people that pass-by (Koch et al., 2014; Koch and Ott, 2011). Figure 1 shows an example of such an information radiator from the CommunityMirror project (Koch, 2025; Ott, 2018).

The information displayed can increase transparency about what people are currently working on, and thus enhancing collaboration. Information radiators are often based on content from and are part of enterprise collaboration platforms (ECP), which are “[...] *complex, large-scale information infrastructures comprising an ecosystem of highly integrated tools and functionality to support collaborative work and information sharing in organizations*” (Schubert and Williams, 2022). For an ECP, its content is perceived as a significant factor, positive or negative, for the platform’s usefulness. The content creation, use, and management functionalities drive an ECP (Nitschke et al., 2019). As described by Diehl et al. (2013), missing guidelines for document management pose barriers to these platforms, such as issues of content quality and information overload, as identified by Nielsen and Razmerita (2014). In addition, the following aspects are perceived as barriers by Williams et al. (2013): search, retrieval, management of social content and large volumes of new content, archiving, retention, and records requirements. Information radiators are a potential



Figure 1. A CommunityMirror application deployed at the semi-public corridor of an office building.

solution to these barriers. They present content based on serendipity to tackle information overload and information search and retrieval. However, it is vital to identify which content types, or mixtures of content types, positively impact interaction with such devices.

A literature analysis by Sprecher et al. (2021) investigates the content displayed in example applications for large displays. The authors conclude that the content displayed on large displays is relevant to maintaining user interest in interacting with it. They also relate display blindness (Huang et al., 2008; Memarovic et al., 2015; Müller et al., 2009) to generic content that does not align with the user's interests. Aspects observed in their literature analysis that impact the content's success and failure include whether the content is location-specific, the frequency of content changes, or whether it is timely relevant, such as the bus schedule or weather forecast. Also, they identify that user-generated content may positively influence engagement with large displays; however, the objectivity of this content type is limited, which may lead to negative effects. Interestingly, Huang et al. (2008) identify in their work that user engagement and attention are not dependent on the displayed content type. While this work dates back to 2008, observing engagement across content types over a longer period and with a small intervention that puts certain content types in the spotlight might reveal whether this position still stands in the context of information radiators.

3 Methodology

We use a quantitative approach to answer the two research questions presented in the introduction. Therefore, we investigate an application for large information radiators in semi-public areas: the CommunityMirrors (Koch, 2025). Currently, this application is deployed on four large interactive displays within the buildings of the Computer Science faculty of a European university (CommunityMirror Network) and displays three different content types (Figure 2):

- **People** (employee profiles of the Computer Science faculty; light blue),
- **Organizational Units (Org Units)** (such as research institutes, centers, and professorships; dark blue),
- and **Artifacts** (green), which include publications, projects, announcements, and other thematic entries, in most cases related to People and Org Units.

People and Org Unit items are maintained manually, whereas Artifact items are automatically imported from multiple data sources (Koch, 2025; Lachenmaier et al., 2011). The three content types are distinguished clearly, and there are no overlaps in the data basis. While the number of available Artifacts varies depending on the connected sources, the overall number of People and Organizational Unit items remains relatively stable.



Figure 2. A screenshot of the CommunityMirror application with a panel of professors and the three content types: People (light blue), Org Units (dark blue), and Artifacts (green).

We conducted a longitudinal field study by quantitatively analyzing log data on touch interactions of the two most-used CommunityMirror instances in the CommunityMirror Network. In the CommunityMirror software, all content types are initially shown only with their titles and an image, with additional details revealed on demand through touch. Consequently, we can assume that users who touch items are interested in reading more about the selected content.

As a lightweight awareness intervention aimed at increasing the visibility and quality of People items, the content type People was put into focus. The intervention

consisted of two steps: a poster on the information radiator (of item type Artifact) prompted employees to update their data, followed by an email to all faculty members. We explored whether these two steps (1) improved or encouraged employees to update their profiles and (2) whether this increased the interaction of the users with such information in the long term, as they were particularly nudged towards this certain content type.

All data samples included interactions by content type, considering only data between Monday and Friday, between 7 a.m. and 6 p.m., the main office hours, to reduce noise from atypical usage patterns outside regular workplace activity. In addition to interaction counts, the total counts of how often the content type was displayed on the two CommunityMirrors were also identified to consider the interaction rate and proportional imbalances between content types. As an overview, the following data samples and periods (YYYY-MM-DD) are included in this study:

1. **Before interventions:** 2023-09-15 – 2023-12-15
2. **During interventions:** 2024-02-06 – 2024-05-10
3. **After interventions:** 2024-05-13 – 2024-08-13

To analyze the log data, we applied statistical analysis to derive insights into how the users engaged with the information radiator over the study period. The unit of analysis was the aggregated interaction counts for each content type and phase. We interpret interaction events as an observable proxy for attention and interest, not as a direct measure of collaboration or knowledge exchange.

4 Results

The results section presents an analysis of interaction logs, detailing interaction rates by content type and changes related to the lightweight intervention.

4.1 Interaction Rates of Content Types

Table 1 shows the interactions for each content type and, in total, for the observation times before, during, and after the intervention (data between September 15th, 2023 – August 13th, 2024). The interaction rates are computed as the ratio of interactions per content type to the overall number of displayed information objects of that content type (information objects are usually displayed for about 15 seconds as they move across the screen and then disappear).

Overall, the CommunityMirrors mainly presented Artifact items (~ 60%) and rather less People items (~ 21%) or Org Unit items (~ 19%). These relations did not differ strongly between the data samples.

The next section presents an in-depth analysis of all values to assess whether the intervention of highlighting the People items by proactively motivating users to update their profiles has a lasting impact on interactions with this content type.

4.2 Intervention: Updating Employee Profiles

In our intervention, we focused on People items, which are displayed by the CommunityMirrors in light blue. This content type is particularly interesting because

Phase	Type	Metrics				
		Total Inter-actions	Relative Inter-actions	Total Displayed	Relative Displayed	Interaction Rate (in 10^{-3} %)
Before	People	92	42.2%	877836	20.7%	10.48
	Org Units	41	19.3%	799672	18.9%	5.13
	Artifacts	83	38.5%	2563505	60.5%	3.24
	Total	216	100%	4241013	100%	5.09
During	People	147	36.7%	1035398	22.2%	14.2
	Org Units	119	29.7%	947595	20.3%	12.6
	Artifacts	135	33.7%	2683138	57.5%	5.03
	Total	401	100%	4666131	100%	8.59
After	People	81	27.9%	788276	20.9%	10.3
	Org Units	74	25.5%	712808	18.9%	10.4
	Artifacts	135	46.6%	2262816	60.1%	5.97
	Total	290	100%	3763900	100%	7.71

Table 1. Interactions and display counts per content type and phase. Interaction rate is computed as the ratio of interactions to display occurrences for the respective content type.

the information relies on employees' contributions and can be tailored to their preferred information, e.g., by covering topics and research areas they are working on. At that time, the People items, the employees' profiles, were lacking up-to-dateness and completeness. Therefore, it was questioned whether employee representation could be improved and how this would affect interactions with this content type. Consequently, a two-step intervention took place in February and March 2024:

1. **First intervention (2024-02-05):** A poster promoting the update of the employee's profiles was included and displayed as an Artifact item regularly by the CommunityMirror.
2. **Second intervention (2024-03-04):** An email was sent to all faculty members asking them to update their profiles.

From the first intervention, we received no feedback and no profile improvements. The second intervention elicited feedback and profile improvements from 10 employees (from a total of 240). Following these interventions, the interaction logs are analyzed repeatedly to identify long-term behavioral changes. To select the correct data sample during and after the intervention, we consider the novelty effect (Koch et al., 2018) triggered by the intervention by analyzing log files over a longer period. The deployment has already been running for two years in its current form, so there should be no novelty effect due to the deployment itself. As shown in Figure 3, which depicts the number of interactions during the interventions, the intervention's direct effect on interactions with the CommunityMirrors evaporates approximately after two months. Consequently, the data sample **during** the intervention was selected between 2024-02-06 and 2024-05-10. The interaction data from three months later (2024-05-13 – 2024-08-13) are used to analyze the long-lasting impact, compared with the data before (2023-09-15 – 2023-12-15), captured from a similar time period concerning employees' availability.

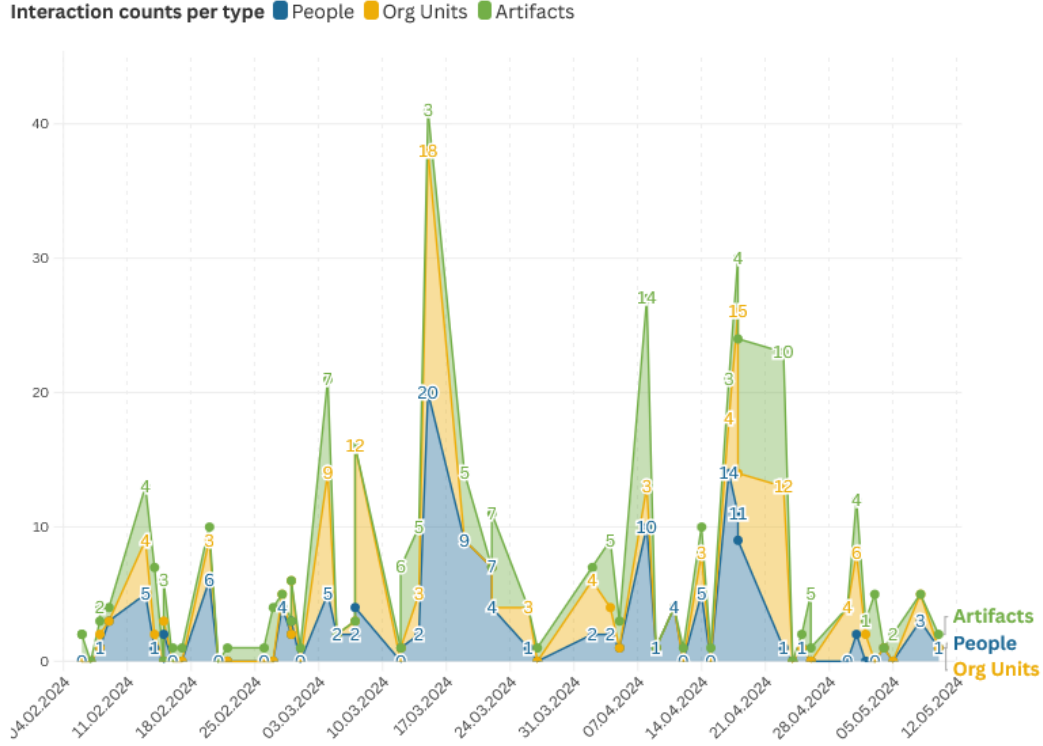


Figure 3. The interactions per content type **during** the lightweight intervention highlighting People items.

In the following, we interpret interaction rates as engagement measures that account for differences in display frequency across content types. Investigating the interaction rates (Table 1) across the before, during, and after phases, we observe that People items consistently exhibited the highest interaction rates normalized by display frequency throughout the observation. A sharp increase during the intervention was followed by a decline afterward, even slightly below the pre-intervention level. In contrast, the Org Unit items showed a sustained increase in interactions, with a strong rise during the intervention and a higher interaction rate maintained even post-intervention. For Artifact items, interaction rates were generally low, with only a moderate increase during the intervention. However, the slightly increased interaction rate could be sustained even in the long term for this content type. These findings suggest that the intervention to improve the People items had only a brief impact on this particular content type. However, it had a strong and lasting impact on the interaction with Org Unit items and a modest, sustained effect on Artifact items. Notably, Org Unit items provide details on the research activities of specific research groups or professorships and include person-related information by displaying the employees of this organizational unit. Consequently, the intervention was accompanied by a sustained increase in interaction rates for Org Units. Overall, the interaction rate for the information radiator increased during and after the intervention compared with the pre-intervention phase.

Analyzing the long-term effects of highlighting People items, the employees' information displayed on the CommunityMirrors, requires additional statistical analysis. To statistically validate the observed differences across phases and content

types, we conducted a Chi-Square test of independence. The requirements for the Chi-Square test were checked and met. The results were statistically significant, $\chi^2(4) = 21.36, p < .001$, indicating that the overall interaction behavior changed significantly across phases and content types. The detailed values for each content type are displayed in Table 2 and indicate a significant impact on interactions with Artifacts and Org Unit items over time, verifying the previously observed changes in interaction rates. Interestingly, this suggests that the intervention only positively affected interaction with People items in the short term, whereas in the long term, it was associated with significantly higher interaction rates for the other two content types, Artifacts and Org Units. One possible explanation is that the intervention temporarily increased the overall attention to the information radiators, the CommunityMirrors, which may have redistributed interactions across content types by making the employees more aware of their existence. To better understand users' perceptions of content types, a qualitative study is required to provide additional insights.

Content Type	Chi-Square Statistic	p-value
People	5.231	0.0732
Org Units	7.918	0.0192
Artifacts	8.421	0.0147

Table 2. Chi-Square test results for each content type with significant results ($p < 0.05$) for Org Units and Artifacts that indicate a change in interaction distribution over time.

4.3 Summary of Results

Consolidating the findings of the longitudinal log data analysis, we can draw the following conclusions for each content type and their effect on engaging with large information radiators in semi-public areas:

- **People:** Content about People, employees, exhibited the highest baseline interaction rates and was not sustainably increased by this lightweight intervention that shifted the focus towards them. However, they may serve as an entry point for users to engage with the display in general and explore other content. For designers, this suggests that person-related content can attract initial attention but should not be the sole target of engagement interventions.
- **Org Units:** Content about organizational units has excellent potential for high interaction rates and combining People and Artifact items. Increasing awareness of the CommunityMirrors through the intervention was associated with significantly higher interaction rates for this content type, indicating a high potential to steer engagement with these devices by nudging users toward related content types, such as People items. For designers, Org Units may be particularly useful for linking individual profiles to broader organizational contexts.
- **Artifacts:** This content type has the lowest interaction rates but significantly benefited from the intervention with a modest increase in interaction rate, even though it was not the focus of it. This could imply that lightweight interventions or nudges towards the information radiator also significantly impact the Artifact items' engagement. For designers, Artifacts may require stronger

contextualization or awareness support to become more engaging, as their interaction rates appear particularly sensitive to changes in overall display attention.

5 Limitations

Despite these insights, our study has some limitations. The quantitative data focused on the logged interactions with certain content types. However, the number of such interactions is strongly influenced by context and surroundings, including events and seasonal activities (holidays, exam periods, etc.). An attempt was made to consider such contextual factors in the data selection by choosing periods assumed to have roughly equal influence. Still, of course, discrepancies can remain due to these aspects. It would be beneficial to base the calculation on the number of potential users who can interact by passing the screen.

In addition, we consider only direct use by touch interaction and do not differentiate between repeated interactions by the same individual and interactions by different users. It would be interesting to include passive use, such as observing and consuming content without touch interaction by simply looking at information, and to include the number of such users in the analysis.

Another aspect that limits the informative value of our results is the unknown impact of the novelty effect. Given the relatively long evaluation period selected for the intervention phase, the actual impact of novelty remains unknown and may vary across interventions. An additional analysis of interactions after a longer period may provide additional insights; however, this would require no changes to the application for a long time to preserve comparability.

6 Discussion and Conclusion

Information radiators raise awareness of employees' work and achievements by proactively displaying content of different types. The research questions concern whether and to what extent different content types affect engagement with information radiators and how interventions impact it. In the context of an established application for information radiators, CommunityMirrors, this work investigates its three content types: People, Org Units, and Artifacts. To assess their engagement potential, interaction rates were measured, and a lightweight intervention was implemented that shifted users' awareness toward People items by motivating employees to update their profiles displayed on the radiator. For both cases, longitudinal field data were collected from the application's logging files and subsequently analyzed.

The quantitative analysis of interaction logs from large information radiators reveals which content types foster interactions. The datasets contained interaction counts and rates for the three months before, during, and after the intervention. Comparing the interaction logs, users generally engage more with People items on such devices, as evidenced by the highest interaction rates. However, the intervention only improved the interaction with this content type in the short term. Instead, it significantly (Chi-Square test) impacted the overall interaction with the information radiator, particularly with Artifacts and Org Unit items. Overall, People

items exhibited the highest interaction rates, followed by Org Unit items, and lastly Artifacts. While Huang et al. (2008) argue that engagement with public displays may be largely content independent, our longitudinal findings indicate content-type-specific differences in interaction rates in a semi-public workplace context. Additionally, the intervention's impact reveals distinct engagement trajectories in this context, and nudges, for example, that highlight a particular content type, may redistribute engagement rather than amplify the target content, thereby affecting engagement with the overall information radiator. This suggests that contextual factors such as publicness, recognizability, and organizational embedding may moderate the relationship between content type and engagement. Consequently, content sensitivity in socially visible settings may shape interaction behavior differently from that in fully public or fully private contexts.

Beyond the specific context of CommunityMirrors, these findings point to a more general implication: interventions for large semi-public displays may not selectively increase engagement with specific content types, but instead influence engagement across the entire system. This indicates that engagement is a system-level phenomenon shaped by contextual factors (e.g., semi-public usage conditions and display visibility) and social factors (e.g., the recognizability of people and organizational relevance).

However, more in-depth studies with users are required to better understand the user behavior. Potential future projects will examine whether multiple nudges toward other content types or application features have similar effects on interaction rates or reveal additional engagement insights that support the operational team for such devices.

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