DARK DESIGN PATTERNS AND GAMIFICATION AS THE HEART OF DATING APPLICATIONS' BUSINESS MODELS

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Introduction

The number of involuntary singles that has been rising significantly in industrialized societies represents significant business opportunities. This dating market is capitalized by the American Match Group, the parent company of Tinder, Match, Hinge, OkCupid, and several others. The Match Group's total revenue in 2021 was 851,68 million U.S. dollars (Statista, 2023). Dating applications represent a paradox: on the one hand, they provide a monetized platform for people to form relationships, yet on the other, the more people who find partners, the less revenue to the company. With this paradox as a backdrop, the extended abstract at hand examines the business model of dating applications asking the following research question:

- What characterizes the business models of dating applications?

To provide a nuanced picture of this, we conducted a 2022-study combining data about dating apps and Norwegian app users: (A) 22 in-depth interviews with current and previous users (aged 24–49 years) of dating applications users; (B) a systematic analysis of 30 dating apps for persons looking for a partner (and not a fling, hook up or friends) in Google Play and Apple's App Store; and (C) a diary study of four of these 30 dating applications where a female and a male researcher individually studied the apps for one week each in a walk-through-method way (Light et al., 2018) by employing an ethnographic approach (writing daily field notes).

Value Creation in the Platform Economy

Dating apps are part of the app economy and the platform economy where digital data are a key component for value creation (Bown, 2022). Business models explain how firms create and capture economic value (Zott, Amit, & Massa, 2011). The business model of digital platforms facilitates the digital opportunity to combine different sets of users, markets, datasets, or IT-systems (De Reuver, Sørensen & Basole, 2018). A platform differ from traditional pipeline companies in especially three ways (Van Alstyne,

Parker & Choudary, 2016): (1) Resource control versus resource orchestration. In platforms, the network of contributors and their assets are the chief resources. (2) Internal optimization versus external interaction. Platforms create value by facilitating interactions between external actors. (3) Creating customer value versus ecosystem value. Platforms seek to maximize the total value of an expanding ecosystem in a circular, iterative, feedback-driven process.
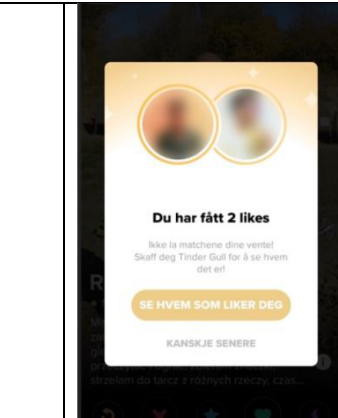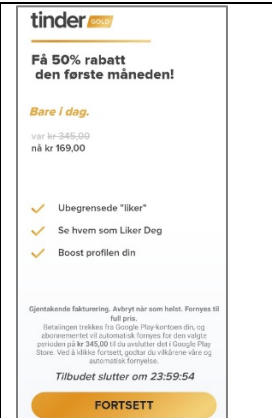
Common revenue models in the mobile app economy are (1) premium (pay-per-download fees or copy sales); (2) freemium (in-app purchases); (3) subscription fees; and (4) advertising (Tang, 2016). Until recently, the ad-revenue model has been a cornerstone of app monetization. Now, however, due to, amongst others Apple's changes for IDFA (the key identifier used for advertising by app publishers), in-app purchase-models are outperforming ad-revenue models (Farago, 2020). Thus, dating apps adjust their business models to increase in-app purchases. Dark design and gamification are well-known design features to nudge such purchases.

Dark Design Patterns and Gamification
Dark design patterns is a term used to describe user interface designs that can lead, or manipulate, the user to act in certain ways, such as buying or signing up for something they initially did not intend to (Brignull, 2013; Mathur, Kshirsagar, & Mayer, 2021). Dark pattern design elements are known to be at play in online games and shopping sites yet are also observed as a business trend (Mathur et al., 2021). Some of these has been described as exploitative, such as Match.com that knowingly lets scammers generate fake messages of interest in its online dating app to get users to sign up for its paid service (Narayanan, Mathur, Chetty, & Kshirsagar, 2020). Gamification is design principle that share some of these characteristics, by enhancing services with (motivational) affordances to invoke playful experiences and further behavioral outcomes (Hamari, Koivisto, & Sarsa, 2014).

Findings
Key take-aways from our study are that dating apps use both dark-design patterns and gamification as design features to create value and to keep the users engaged in the apps. Although it is possible to create a profile for free, the opportunities for searches, as well as interaction and communication with others, are typically limited for non-payers. One example of this limited access for non-payers is happn, which has "Crush-time," a quiz where four profiles appear, and the user has to guess which one of these has liked you (Screenshot 1). To find out the answer to the quiz (Screenshot 2), as well as who liked you (which is communicated to the user as a notification), one has to pay (Screenshot 3). Screenshots 2 and 4 illustrate the dark-design pattern of psychological pricing.

Screenshot 1. Illustration of "crush-time" at happn.	Screenshot 2. Illustration from happn of psychological pricing (a countdown to when the user can give likes on others' profiles, accompanied with an offer to pay for a membership that enables unlimited likes).	Screenshot 3. Illustration that shows blurred pictures of persons who have liked your profile. However, to see whom this is, the user must buy membership at Tinder.	Screenshot 4. Illustration of psychological pricing (50% offer with a time limit ("only today") and a visual countdown, price appearance (the "normal" price is shown with a ~~strikethrough~~)) at Tinder.

Gamification features used to stimulate the user's emotional curiosity are also found in our interviews. For example, Felix (single, 38 years), who initially had the free version of Tinder, but when he got a notification that someone liked him, he paid immediately for a membership to see who this was, explaining, "I am very curious, I have to know who this is." As another example, Karen (single, 31) explained she pays for Tinder because they offered her a 50% discount. She is also a paying member of the Match app, as the free version had too many limitations.

Other gamification design features we found in this study are a high volume of notifications; the unlocking of different opportunities; quizzes; badges; new levels; progress; and super-likes to mention a few. When the user wants to delete his or her account, the dating apps also use a well-known dark pattern labelled the roach motel, which lets users do something easily, like sign up for an account, but makes it extremely difficult to deactivate and delete it. In other instances, the dating apps plays on the users' feelings, asking if the user is really sure of their decision to leave, typically stating something like "Sorry to let you go." In addition, several of the apps save by default the users' profile for a month after leaving, in case s/he wants to return.

Conclusion
To conclude, despite a few exceptions where one must buy a membership to create a profile in dating apps, most apps have a business model that creates revenue through a mix of an in-app purchase-model and subscription fees. The apps typically market themselves as free, yet they use several dark design and gamification features to create

and spark emotional curiosity and engagement that in turn brings in revenue to dating app companies. Several of the users stated that they have experienced the apps as manipulative, emotionally exhausting and that they created the same kind of "addiction" or "cravings" they experienced in social media. Clearly, designing for emotional engagement is a key value-creating element in the dating app companies' business models.

References

Bown, A. (2022). *Dream Lovers. The Gamification of Relationships.* Pluto Press.

Brignull, H. (2013). Dark Patterns: inside the interfaces designed to trick you. *The Verge* 29. Retrieved from https://www.theverge.com/2013/8/29/4640308/dark-patterns-inside-the-interfaces-designed-to-trick-you

De Reuver, M., Sørensen, C. & Basole, R. C. (2018). The digital platform: a research agenda. *Journal of information technology*, 33(2), 124-135.

Farago, P. (2020). Are App Developers Shifting Revenue Models as Advertising Gets Challenged? Retrieved from https://www.linkedin.com/pulse/app-developers-shifting-revenue-models-advertising-gets-peter-farago/

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work?--a literature review of empirical studies on gamification. Paper presented at the 2014 47th Hawaii international conference on system sciences.

Light, B., Burgess, J., & Duguay, S. (2018). The walkthrough method: An approach to the study of apps. *New Media & Society*, 20(3), 881-900.

Mathur, A., Kshirsagar, M., & Mayer, J. (2021). What makes a dark pattern... dark? Design attributes, normative considerations, and measurement methods. Paper presented at the Proceedings of the 2021 CHI conference on human factors in computing systems.

Narayanan, A., Mathur, A., Chetty, M., & Kshirsagar, M. (2020). Dark Patterns: Past, Present, and Future: The evolution of tricky user interfaces. *Queue*, 18(2), 67-92.

Statista (2023). Annual operating income of the Match Group from 2017 to 2022. Statista Research Department, Sep 14, 2023. Retrieved from https://www.statista.com/statistics/1120192/match-group-annual-operating-income/

Tang, A. K. (2016). Mobile app monetization: app business models in the digital era. International Journal of Innovation, *Management and Technology*, 7(5), 224.

Van Alstyne, M. W., Parker, G. G., & Choudary, S. P. (2016). Pipelines, platforms, and the new rules of strategy. *Harvard business review*, 94(4), 54-62.

Zott, C., Amit, R., & Massa, L. (2011). The business model: recent developments and future research. *Journal of management*, 37(4), 1019-1042.