UNIVERSITI TEKNOLOGI MARA

NON-MONETARY INCENTIVES IN PARTICIPATORY SENSING FRAMEWORK: A CASE OF MOBILE HEALTH

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ABSTRACT

Non-communicable diseases (NCD), which are related to unhealthy lifestyles, cause a high proportion of deaths across the globe. This calls for a participatory sensing solution that may significantly expand access to healthcare to more people. Participatory sensing allows citizens to monitor activities, while enabling researchers and stakeholders to collect, analyse, and share local knowledge. However, in the absence of adequate participation, the participatory sensing system will fail to collect meaningful findings for decision making. Recent developments in the field of incentives have led to a renewed interest in non-monetary strategies to improve participants' performance. Nevertheless, most of the studies typically addressed the extrinsic incentives and largely overlooked the intrinsic aspect of the non-monetary incentives, thus losing the potency to fulfil the needs of the data contributor holistically. The inadequacy creates a false impression that technology designers cannot demonstrate intrinsic incentives in the participatory sensing system. Consequently, there is limited knowledge on the implementation of various non-monetary incentives in a mobile health monitoring campaign. For these reasons, this thesis proposes a non-monetary incentive in participatory sensing (NIPS) framework, which addresses both intrinsic and extrinsic incentives. The framework is evaluated in a mobile health setting. This study connects quantitative and qualitative data using sequential explanatory mixed-method research designs, drawing on three research objectives: 1) to determine the theory-driven constructs as part of the proposed non-monetary incentive framework through theoretical study and survey analysis of 301 respondents; 2) to design incentive mechanics that demonstrate the non-monetary incentives constructs through the content analysis of 283 apps; and 3) to evaluate the effect of non-monetary incentive framework towards participant performance through a case study in mobile health participatory sensing campaign. The validation result showed that the proposed framework is practical to be executed in the mobile health setting. Findings showed that non-monetary incentives, particularly of intrinsic value, could be effective to reinforce participant performance in participatory sensing data collection. This study contributes to the body of knowledge of participatory sensing in two ways: extending the Self-Determination and Motivation 3.0 theories in participatory sensing setting, and extending the literature of incentives research area. From practical perspectives, this study aids system developers to improve participatory sensing system features, helps campaign organisers in participant recruitment and health campaign evaluation, and assists health practitioners and policy makers in decision making.

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