Technology Legitimation and User Resistance: The NHS COVID-19 App

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Abstract. Innovative technologies often face acceptance challenges. This is especially true when they constitute disruptive innovations. Disruptive innovations can forcefully alter the way things are done in the economy and society and have differential impacts for social groups. Legitimacy – the fit between an innovation, and society at large – is an important explanatory factor of the success of disruptive technologies. The micro-judgements of legitimacy that individuals make with regards to a technology, can help understand why some innovations succeed or fail. Likewise, users' actions when using said innovations may indicate how acceptable the technology is to users. This paper analyses how users judge, and use, the NHS COVID-19 Test & Trace app. Preliminary findings suggest that individuals' micro-legitimacy judgements are strongly related to the decision to use the app or not, and that users have adopted a number of workaround behaviours to resist or compensate for the app's functionality.

Keywords: Legitimacy · Legitimation · Technology acceptance

1 Introduction

This paper analyses how users judge, and use, the NHS COVID-19 Test & Trace app. The COVID-19 pandemic caused widespread changes to individuals' behaviour. The need to reduce contagion led to the imposition of social distance mandates, lockdowns and the shuttering of business and other organisations. The collection and analysis of data about individuals' contacts was presented as a mechanism to address the social and economic impact of the pandemic, helping reduce infection rates while allowing society to continue to operate, albeit in managed ways [1]. Mobile phone data collection and analysis frameworks were developed to estimate proximity between users and the extent of time of contact. The UK National Health Service (NHS) developed and implemented one such application, the NHS COVID-19 Test & Trace app, which was promoted by the UK government as part of the country's Test and Trace system.

Innovative technologies often face challenges. This is especially true when they constitute disruptive innovations. In the traditional sense, disruptive innovation is characterised as strategic actions taken by companies, which give them an advantage over competitors in the same market; the extent of the disruption confined to the market

segment in which the disruptor and disrupted operate [2]. Recent scholarship takes a broader view of the extent to which disruption can have an impact: the discontinuity caused by disruptive innovations can reverberate across social systems [3]. Systems suffer disruption when a significant portion of agents in that system must reformulate their strategies in order to survive an innovation [4]. Disruptive innovations can forcefully alter the way things are done in the economy and society, challenge social contracts, affect social mores and norms, and have differential impacts for social groups [5]. For this reason, legitimacy – the fit between an innovation, and society at large [6] – is an important explanatory factor for the success – or otherwise – of disruptive technologies. Specifically, the micro-judgements of legitimacy that individuals make with regards to a technology, can help understand why some innovations succeed or fail [7]. Likewise, users' actions when using said innovations – for example, resisting the requirements of the technology – may indicate how acceptable the technology is to users [8].

This paper approaches the acceptability of the NHS COVID-19 Test & Trace app from the user/evaluator perspective, to address three research questions:

1. Which dimensions of legitimacy are more important for users and non-users of the NHS COVID-19 app?
2. Do users of the NHS COVID-19 app engage in workarounds or resistance behaviours?
3. Is there a relationship between users' reported need for legitimacy and user behaviour?

2 Literature Review

2.1 Legitimacy

Legitimacy consists of "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" [6]. Based on a legitimacy-as-perception perspective, individuals' judgements are not aggregated in uniform groups, but are regarded as single individuals making their own judgements or adopting judgements from others. Legitimacy is, therefore, a multi-level phenomenon that can be studied at the collective level (macro) and individual level (micro) [9]. This paper focuses on micro-level legitimacy judgements [10], analysing how individual users take active roles in evaluating the legitimacy of a technology [7]. These judgements are underpinned by disparate behaviours, depending on the type of legitimacy involved [11].

Four distinct types of legitimacy can be identified: regulatory, pragmatic, moral and cultural-cognitive legitimacy [12]. Regulatory legitimacy is associated with a perception that the entity being evaluated follows existing rules. This establishes a 'baseline' legitimacy, ascertaining that the entity is legal. The second type of legitimacy is pragmatic legitimacy. This requires an entity being evaluated to demonstrate that it can deliver on claims associated with the measurable performance of its products or services, aligning with the evaluator's interests. The third type, moral legitimacy, relates to values. To achieve this level of legitimacy, an entity must demonstrate that it follows socially valued purposes and goals. The final dimension, known as cultural-cognitive legitimacy,

involves demonstrating the fit between an entity and the evaluator's mental and cultural models and meaning systems [6].

Individual users play a distinctive role in legitimising innovations. This individual level legitimation is distinct from societal level legitimacy [9]. It is possible to assess individuals' judgements of a new technology in terms of expected utility (pragmatic legitimacy), their normative evaluations of it (moral legitimacy), and their cognitive assessments of its comprehensibility and taken-for-grantedness about the technology. These micro-judgements and perception of an innovation guide individuals' behaviours, which in turn help produce the collective perfection of legitimacy within a group [7, 11]. But innovations can be disruptive to social systems, in which case users may modulate their behaviours accordingly. The next section describes how users can sometimes choose to resist innovative technologies.

2.2 User Resistance

One of the most prominent models in the literature on acceptance of technology is the Unified Theory of Acceptance and Use of Technology (UTAUT), an evolution of the earlier Technology Acceptance Model (TAM). The model consists of a multi-level framework of technology acceptance which combines higher-level contextual factors and individual-level contextual factors with the original TAM main affects. These factors result in higher or lower acceptance and use of technology [13]. The model has since been subject to a wide variety of extensions, which have improved its ability to predict behaviour [14]. However, the UTAUT model has been criticised for taking a narrow view of technology acceptance, as it focuses on beliefs, perception and usage intention. The model may also be approaching the limits of its contribution to knowledge, as it focuses only on the individual user, and assumes a direct relationship between intention and actual behaviour. [15]. One area which UTAUT struggles to explain is user resistance to the technology. User resistance has been identified as a salient reason for the failure of innovative technologies, especially in cases of information systems implementation [16]. A variety of reasons for user resistance have been pointed out, including cynicism among users [17], a bias towards the status-quo [16] and users' personality traits [18].

Beyond the causes of user resistance, it is relevant to understand the forms which resistance can take – the behaviours individuals will engage in to resist an innovative technology. Users' responses can be functional – signalling the existence of problems with the technology or its effects; or dysfunctional – preventing the adoption of a technology, or generating conflict or ill-will [19]. This suggests that user resistance can be a positive force – highlighting aspects of the technology which do not work as expected or have unintended or negative consequences. In addition, users can develop workaround behaviours – a mismatch between the expectations of technology and actual working practice [8]. In their typology, Ferneley and Sobreperez [8] identify harmless workarounds (which do not significantly affect workflow or data accuracy). These may be a positive act of resistance (enhancing working practices) or a negative act of resistance (if they aim to oppose or challenge the system). In hindrance workarounds, subsequent actions are avoided. These can be positive (if the system is badly designed) or negative (if the action is required by colleagues or management). Finally, essential workarounds are actions necessary to complete the task at hand, and constitute positive resistance.

Users' behaviours when confronted with an innovative, possibly disruptive, technology are impacted by their micro-judgements of legitimacy (Sect. 2.1). This paper will ascertain if resistance behaviours may be related to the salience of specific types of legitimacy.

3   Methodology

The study chose the NHS COVID-19 Test & Trace app as a salient case for study of disruptive technology acceptance and user behaviour, via a 3-stage methodology. Phase 1 involved asking a group of users to keep diaries of their interactions with the NHS COVID-19 app over a four-week period, and reflect on their experiences and opinions of the NHS Test & Trace system. Users were assured that all data collected would be anonymised, and that no behaviours would be reported. They were asked to write down any notifications they received from the app; their feelings and actions in relation to those notifications; and any wider relevant thoughts and opinions, for example relating to news items about Test & Trace, conversations with friends or family members, etc.

Phase 2 involved a number of online Focus Groups with the participants in Phase 1. Phase 3 involved a series of online Focus Groups with non-users of the app, as the researchers were keen to explore whether any behaviours or opinions (such as privacy concerns relating to sharing personal data) might differ between users and non-users. All Focus Groups were recorded, and the discussions were transcribed. The Focus Groups followed a structure protocol.

4   Preliminary Findings

4.1   Legitimacy of the App, and How It Relates to Adoption and Non-adoption

- Users' reasons for adoption relate to the app's pragmatic legitimacy (access to public places which required checking in or traveling abroad) and moral legitimacy ("doing the right thing" to help address the pandemic).
- Non-users' reasons for rejecting the app relate to a perception that it lacks moral legitimacy (the app violates users' rights to choose what to do) and cultural-cognitive legitimacy (questions about data collection, data storage and privacy; and perception that the app's use is not widespread enough for it to be useful).
- The last point – that there would need to be a critical mass of users for the app to be useful - was also noted by users. It affects both the app's cultural-cognitive legitimacy and its pragmatic legitimacy.

4.2   Usage and Workaround Behaviours

- Users report that the app had limited functionality, and would like to see more features. They perceived that the app was not working, or not properly developed.
- False and unclear notifications led to a perception that the app was not fit for purpose. Users were perplexed by the reasons for some notifications, and chose to turn the app off in situations where they believed it might produce false positives (essential workarounds).

- Individuals chose not to use the app, either because it did not work properly (positive hindrance workarounds), or because nobody else was seen to be using it (negative hindrance workarounds).

4.3 Next Steps

The next steps of the analysis involve detailing the responses to research questions 1 and 2, and addressing research question 3 – relating legitimacy micro-judgements to workarounds and resistance behaviours. This will contribute to an inter-disciplinary understanding of how acceptance or rejection of an information system relates to its perceived legitimacy.

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