

# Tea Gardens: RFID and Common Pool Resources

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## ABSTRACT

This paper outlines popular concerns about RFID technology and its implications for privacy and civil liberties. These concerns are based on the assumption that RFID will be used for “top down” surveillance by governments and corporations against individual citizens. This assumption is contrasted with Elinor Ostrom’s work on the self-organised “bottom up” management of Common Pool Resources, such as irrigation water and fish stocks, which rely on mutual monitoring, or “peer to peer” surveillance, to preserve these renewable resources. A role for wireless sensor technology in lowering the transaction costs of mutual monitoring is proposed. The paper then describes a practical experiment using RFID to manage a simple but unusual CPR.

## Keywords

RFID, Common Pool Resources, surveillance, mutual monitoring, transaction costs.

## 1. BIG BROTHER IS WATCHING

### 1.1 Stop RFID

If RFID has entered the public consciousness at all, it is as a sinister surveillance technology. The Stop RFID campaign, run by Consumers Against Supermarket Privacy Invasion and Numbering, calls on its supporters to “fight this battle before big corporations track our every move.” [3] Along with tracking the location of mobile phones, CCTV cameras, and biometric ID on passports, RFID is used by “them” against “us” without our understanding or permission. Michel Foucault called this pervasive surveillance “discipline” in which subjects become so certain that they are being watched at all times that it is impossible for them to think in a critical, anti-authoritarian or subversive way [2].

### 1.2 Tragedy of the Commons

Common Pool Resources (CPRs) are natural or man made resources such as fish stocks, grazing land or road bridges which provide benefits to groups of individual appropriators, but if overused will run out. CPRs are often described as subject to the “tragedy of the commons”, for example farmers cutting down trees to burn without allowing time for new trees to grow. In such cases individuals take as much of a limited resource as they can because they feel that everyone else is already doing the same, causing the destruction of the CPR. By acting rationally as individuals, the appropriators create the worst result for themselves and the group as a whole.

The usual solutions offered for the tragedy of the commons are “top down”, either state management of the CPR or private ownership by a single corporation or landlord. However Elinor Ostrom has found numerous CPRs, including grazing land in Switzerland and Japan, irrigation water in Spain and the Philippines and fish stocks in Turkey, that are all successfully managed from the “bottom up” by the farmers and fishermen who use them [1]. These resources have been sustained and improved over many generations without succumbing to the tragedy of the commons. The appropriators all show restraint in the way they use the CPR and Ostrom found a number of common rules which govern the use of such resources. These rules include clearly defined boundaries and limits to who has a right to use the resources; shared norms of behaviour and a shared history and future among the appropriators; mutual monitoring by the appropriators to make sure no one is taking more than their fair share.

### 1.3 Peer to Peer Surveillance

Self-organised “bottom up” management of Common Pool Resources succeeds because the appropriators all engage in mutual monitoring. Each farmer checks that the other farmers do not cut down too much wood. Each fisherman checks that others do not catch too many fish. When an appropriator is caught breaking the rules, shame and ostracism are often the most effective punishment, because everyone shares the same norms of right and wrong behaviour. Maintaining a CPR in this way though has high transaction costs. Spanish farmers who share water to irrigate their crops have to pay ditch-riders to patrol the irrigation canals and make sure that other farmers do not steal extra water. If these transaction costs become too high, it no longer worth accepting the rules governing the CPR, and a tragedy of the commons follows.

Wireless sensor networks could be used in the Spanish situation to lower transaction costs. Meters could be installed to measure the flow of water to each farmer, and neighbouring farmers alerted automatically by mobile phone if someone was stealing water. An automated system like this increases profits for each farmer from the CPR, meaning that appropriators are more likely to stick to its rules.

## 2. TEA GARDENS

### 2.1 The Media Centre

The Media Centre houses around 100 start-up small businesses all sharing the same building in the city of Huddersfield, England [4]. It provides tenants with low cost office space, including shared reception facilities, meeting rooms, secure access and technical support. Most of the companies housed in the Media Centre building operate in the creative and media industries, and so rely on knowledge and innovation for profitability.

As well as a physical infrastructure The Media Centre operates under a distinct philosophy for supporting the growth of small businesses. It considers the various companies under its roof as a network with shared interests, and that they will benefit from closely knit informal contacts between them to allow the introduction of new ideas, the quick transfer of ideas and the formation of beneficial creative business partnerships.

The Media Centre has two strategies for nurturing this closely knit network. The first is a café-bar within the Media Centre, open to tenants and the public. This café-bar has free wifi access, and is useful for holding short business meetings for those companies that only have small offices. It is intended as a venue for regular unofficial contacts during lunch times and coffee breaks. The second strategy is an artistic programme of new media art, funded and curated by The Media Centre, which introduces new creative thinking about digital media and creates a climate of innovation.

The two strategies have had mixed results. The artistic programme has attracted widespread interest within the UK and beyond, though less so among tenants of The Media Centre itself. The café-bar by contrast has not been particularly popular with tenants or the public. It has gone through several changes of management, and been closed for long periods. When it is open it is often empty, and so makes a rather cold, unwelcoming environment for business meetings and informal contacts. The problems with the café-bar as a venue have had a knock-on effect on the artistic programme. Presentations by innovative digital artists in the café-bar tend to attract only a small audience from outside The Media Centre, and tenants usually do not attend, even though it is in their interests to be aware of new thinking in digital media.

### 2.2 Common Pool Resources

The Media Centre network, as expressed through the café-bar and artistic programme, can be defined as a manmade Common Pool Resource, albeit one that works in the opposite way to a normal CPR: the less people use the café-bar, the less value it has a resource, the less closely knit the network becomes. In this case the tragedy of the commons can be expressed as “No one else is there, so why should I go?”

The problem can be analysed using Ostrom’s rules for successful management of CPRs. The Media Centre’s tenants lack norms of shared behaviour. The network is an intangible resource: the tenants do not fully understand the philosophy of a network, and do not see how it relates to their particular business activity. The lack of shared norms means that ignoring the artistic programme and not visiting the café bar brings no punishment through shame or ostracism.

The boundaries of the CPR are unclear. The café bar and artistic programme are provided by The Media Centre for the good of the network as a whole, so it is unclear who is responsible for the upkeep of the resource. A tenant visiting the café bar and artistic events regularly is performing a provisioning task, ensuring that the resource is available when needed in the future, in the same way that farmers reconstruct irrigation channels each year. The Media Centre cannot undertake this provisioning task, since the network depends on the participation of the tenants. The boundary of the resource needs to be redrawn so as to include the tenants.

At present the transaction costs for provisioning and mutual monitoring are too high. A tenant would need to spend a great deal of time in the café bar waiting to bump into others, and to monitor who did or did not regularly attend events.

### 2.3 Tea Gardens

The Tea Gardens project aims to use RFID to improve the self-organised, bottom-up management of The Media Centre’s network CPR. Each tenant will be given a key ring with an RFID chip inside. A reader will be placed at the door of the main building and at the door of the café bar, and will record the tenants each time they enter. The readings will be displayed on a website that represents a large communal garden. Each tenant will be responsible for his or her own section of the garden. Every time a tenant visits the café bar, their section of the garden will be nourished, and grow new flowers. When a tenant grows enough flowers they will be entitled to free coffee in the café bar. If tenants do not visit the café bar, their garden remains fallow.

The crucial element of the RFID technology will be the range of the readers. The main entrance to the building is three meters wide and the readers will have to detect chips carried in pockets and handbags next to metal keys. Using a swipe card or key fob system with a short-range reader will not be work in this situation because of the additional transaction cost involved. Tenants do not value the CPR highly at present, so they will not make extra effort to swipe into the building in order to strengthen the network.

Tea Gardens will define the boundaries of the CPR to include all the companies in The Media Centre. Responsibility for managing and sustaining the network is shared among the tenants. The success of the Tea Garden is a metaphor for the success of the network. It presents an intangible result in an easily understood form, with an element of playfulness. Ostrom suggests that appropriators tend to value short terms gains from a CPR, so giving tenants free coffee will also encourage participation.

The website considerably reduces the transaction costs of mutual monitoring between tenants, by making it clear who does and does not use the café bar regularly. It also exposes those tenants with fallow gardens to the potential of mild shame and ostracism. Norms of shared behaviour that include regular visits to the café bar and support for the artistic programme will take root at the same time.

## 3. CONCLUSION

Michel Foucault’s notion of discipline has similarities to the mutual monitoring that Elinor Ostrom finds is one of the rules of successful self-organised CPR management. Both attempt to

enforce norms of behaviour. In the case of CPR management however it is clear that these norms help to safeguard valuable resources and the communities and cultures that have developed to make use of them, often over hundreds of years. While objections to corporate deployment of RFID may or may not be valid, imaginative applications of RFID and other sensor technologies, rather than allowing sinister top-down surveillance, will help to sustain existing CPRs and also to define and develop new ones.

#### **4. REFERENCES**

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