Chapter VIII
The Shaping of the IEEE 802.11 Standard:
The Role of the Innovating Firm in the Case of Wi-Fi

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ABSTRACT

In this chapter the authors explore and describe the role of the innovating firm in relation to the standards making process of Wireless-Local Area Networks, and in particular the link between NCR and its corporate successors in the creation of the IEEE 802.11 standard, which is at the basis of the global success of Wi-Fi. Their focus is the leadership role assumed by NCR c.s. responsible for the initiation and creation of an open standard for Wireless-LANs.

1 INTRODUCTION

In integrating the various perspectives on the process of standardisation, we place the entrepreneur at the centre stage, as the entrepreneur decides whether or not to use an existing standard or to develop a new standard by engaging a standards developing organisation to realise the business objectives. For an entrepreneur the participation in standards activities represents a decision of strategic importance. In following an existing standard the strategic option chosen is typically one of adaptation to the 'rules of the game' prevailing in an industry. In an environment that is dominated by one or a few powerful players this can make a lot of sense. In the 1970s, NCR, a leading manufacturer of point of sale terminals, had to acknowledge that most of its terminals

would have to be connected to back-office systems provided by IBM. Hence, to become successful in the market its products had to be provided with interfaces and protocols compatible with IBM mainframe computers. This placed NCR in a follower position, being dependent on functionality that IBM protocols would support. Moreover, it was always confronted with a delayed product introduction relative to its main rival in the business – IBM – as new protocols first needed to be examined and subsequently emulated. IBM was not very forthcoming with interface and protocol information ahead of its own product launch. NCR was faced with interfaces that were proprietary, and would become a *de facto* closed standard through IBM's market dominance.

The alternative and opposite strategic option that was in principle available to NCR was to create competitive advantage by establishing new rules and introducing a new competitive game. De Wit and Meyer observe that a firm wishing to break the rules and intending to establish a leadership position based on a new set of rules must: "…move beyond a compelling vision, and work out a new competitive business model. If this new model is put into operation and seems to offer a competitive advantage, this can attract sufficient customers and support to gain 'critical mass' and break through as a viable alternative to the older business model. To shape the industry, the firm will also need to develop the new competences and standards required to make the new business model function properly." (2004). In hindsight we may conclude that this is what NCR did in relation to developing a new wireless Local Area Networking product to connect point of sale terminals to back-office computer systems, thereby creating the foundation for what would become the global success of Wi-Fi, to be based on an open standard known as IEEE 802.11.

In practice, successful strategies are often much more the result of a process of incrementally finding the right path forward, rather than of bold declarations of intent. The contours of a successful strategy tend to unfold over time as the firm shapes its position in interaction with its environment, while expanding its capabilities in a particular direction.[1] For the onlooker strategy can hence be considered as: "a pattern in a series of important decisions." In this Chapter, our intent is to unravel the historic developments related to the standardization of Wireless Local Area Networks (WLANs) and discover this pattern by exploring and describing the central role of NCR. The firm that has assumed a leading role in exploiting the standards making process, in what appears to be a two-prong approach in achieving its objectives: connecting the process of standardisation to the processes of product development and market introduction. Thereby we acknowledge that a standard derives its success from its adoption in the market.

Our detailed account starts in 1980. The Ethernet, which would become the standard for wired-LANs, was still subject of a major standardization battle within the standards developing organisation IEEE. Moreover, recall that the Apple II had been launched in 1977, while the IBM PC would be introduced in 1981. Mobile computing equipment like laptops and notebooks still had to be introduced.

To place the development of a wireless-LAN standard in context, we will explore, in summary form, the main events in the developments of wired-LANs, thereby recognizing the central role the IEEE as a standards developing organization (SDO) has played in the development of both the wired and wireless LAN standards,. It should be noted that NCR had initiated the development of a wired-LAN based on Ethernet technology to link its point of sale terminals to the back-office computer at the client premises. This had resulted in the MIRLAN product. The LAN developments are of course directly linked to the developments in computing, and it is interesting to note the recurring linkages to the development of the Internet.

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