

**Plataformas de dispositivos móviles y servitización: Hacia un
modelo integrador**

**Mobile device platforms and servitization: Towards an integrative
model**

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Resumen del artículo

El proceso de servitización unido al desarrollo vertiginoso de las nuevas plataformas de dispositivos móviles está constantemente evolucionando hacia el diseño y desarrollo de productos/servicios que responden prácticamente de manera instantánea a las nuevas necesidades y deseos de los clientes. No obstante, tal proceso ha venido unido en el ámbito de los dispositivos móviles al desarrollo de aplicaciones específicas tanto para plataformas abiertas como cerradas. Sin embargo, la evolución tecnológica permite en la actualidad ofrecer servicios de carácter más amplio a través de las denominadas ROMs en plataformas abiertas. Este trabajo analiza los avances y las perspectivas futuras relativas a la estrategia de servitización así como su evolución, tendencias y vinculación de la misma con el desarrollo de plataformas como vía directa de comunicación y colaboración entre la empresa y el cliente.

Palabras clave: servitización, globalización, creación de valor, plataformas, dispositivos móviles

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Summary

Together with the rapid development of new platforms for mobile devices, the servitization process is constantly evolving in the design and development of products and services that respond almost instantly to customers' changing needs and desires. In the field of mobile devices this process has been attached to the development of specific applications for both open and closed platforms. However, the advance of technology currently allows for the provision of broader services through open platforms in the form of ROMs. This paper analyzes the current developments in servitization strategy and proposes future directions it might take in the development of platforms as direct channels for company–customer communication and collaboration.

Keywords: servitization, globalisation, value creation, platforms, mobile devices

Código JEL: M11- Production Management

1.- INTRODUCTION

Service operations management is acquiring an important role in company–customer relations, especially in the design and development of new products and services [1-3]. The new technologies have narrowed distances between corporations and their customers to the point where customers are allowed greater involvement in the design and development of new products and services and have been integrated in a process of cocreation [4-6]. At the same time, however, technological advances and increasingly competitive and uncertain business environments have led many firms to reassess business strategies and models when adapting products to customers' needs and desires and when integrating customers in the supply chain and creation of new products and services.

[7] declared that traditionally-structured firms would need to rethink the process their product went through from design and development to after-sale service. In the event, however, that process has gone much further and the link between a corporation and its customers, which was once only a momentary transaction, has become founded on the supply and maintenance of a whole package of products and services. And this is not only the case for service companies: many manufacturing firms now create added value by combining product offerings with a service component and so consolidate longer-lasting and more interactive relationships with customers who, in turn, have become more demanding, more informed and more inclined to opt for customised purchases. Many firms are therefore attempting to foster customer loyalty as a source of sustainable competitive advantage over time [8,9].

The name now commonly given to this process of using a service component to add value to product offerings is "servitization" [10] and although the term was first used at the end of the 1980s, manufacturers had already been offering varieties of product-associated service for some time (in the form of guarantees and product maintenance, for example) [11]. It is only recently, however, that these service components have ceased to be regarded as mere complements and have begun to carry added value for the products they support.

Researchers agree that manufacturers need to integrate services in their main product lines in order to adapt to customers' needs; but one of the major challenges corporations are now taking up is to make product–service integration complete by using the new technologies based on mobile device platforms which put users in control of the various stages of creating added value in the firm's supply chain [12]. This paper will address these issues by focusing on the current developments in servitization strategy and proposing future directions it might take in the development of

platforms as direct channels for company–customer communication and collaboration. In particular, it will analyse the role played by the main mobile device platforms as arenas for the development not only of mobile applications (apps) but also of read-only memory systems (ROMs), using the principle of operational flexibility to integrate the design and development processes of new products and services. Finally, the paper will also examine two similarly designed models for the development of apps and ROMs that make provisions for users and developers and enable users to collaborate at both company–user and user–user levels.

2.- DEVELOPMENT

2.1.- THE SERVICIZATION PROCESS

The literature on operations management has frequently considered the importance given to servitization as a source of competitive advantage (e.g., [12-16]). Services tend to create longer-lasting links with customers [17], generate higher profit margins and ensure more stable cash flows during the product life cycle [18]. In turn, the new IT technology is allowing customers to become increasingly demanding, critical and capable of accessing remote information about competing firms. Because their desires and needs change, customers also seek differentiated and personalised products, and corporations can offer these by integrating service components in their product lines [19].

The literature also points to a series of reasons why businesses should be adopting servitization strategies [10]. The clearest of these is that services can minimise the risk of customers being attracted by competitors, because the company–customer relationship they create generates a process of communication by which firms can respond to customers' demands. Service variety also positively influences customer loyalty [20], especially when it responds to needs that customers have been able to express themselves using the technology that has been put at their disposal and that, effectively, fosters greater user dependence.

On the other hand, the servitization process is not completely free of difficulties and while many studies describe the stages servitization can go through and the degrees to which it can be deployed (e.g., [12,21,22]), there is still no generalised agreement regarding best practices. Technological progress also rapidly obsolesces products that were perceived as irreplaceable. Because of these factors, having technology platforms of reference upon which to develop tools and apps that favour the servitization process has become key for both manufacturers and service providers [23]. These platforms can alleviate perceived technological uncertainty (the changeable nature of the market offering) and imprecision (the proliferation of technological

dialects) and can also allow corporations to transfer part of the development costs of new services and tools to users and to real and potential customers. At the same time, however, Neely's servitization paradox [24] demonstrates that the process will require enterprises to rethink their marketing strategies and sales and customers, their timescales, and their business model and product offering.

2.2-. TECHNOLOGY PLATFORMS IN THE ARENA OF CUSTOMER RELATIONS

Although currently used to describe the form in which the IT industry is generally configured, the concept of the technology platform takes on a particularly important business component when we look how manufacturers use it when they design and develop products. Practically all manufacturing firms make use of a technology platform on which to develop their product lines and gradually introduce improvements to these [25-27]. But while some platforms have consolidated their position and become the source of dominant designs [28], others have either disappeared or been permanently held back from realising their potential¹.

IT development and the trend towards cost structure optimisation have generally favoured the shared use of technology platforms so that competitors in a single market very often develop technologies together on the same platform and then compete separately to sell their products. This share strategy, which lowers transaction costs by increasing network economies on the basis of synergies, has been especially pronounced in computing and telecommunications, although its influence on the servitization process has been clearly visible in practically all markets. Indeed, the applications derived from these technology platforms have experienced hitherto unprecedented growth rates [29,30].

In turn, the open-source software (OSS) movement has generated the development of OSS platforms that allow users to modify software using a copyleft² licence, in contrast to closed-access proprietary platforms, which belong to a single manufacturer. This duality has allowed the development of mobile device³ platforms and, of these, the OSS platforms are reaching further into the market, even when they have been 'officialised' (and hardware manufacturers have made them more difficult for users to modify). These mobile platforms — or 'intermediaries', as they are often called — are becoming dynamic systems of company–customer interaction and key elements in

¹ In the automotive industry, for example, the straight or inline engine has become the dominant design while Mazda's rotary engine has been withdrawn from the market and the Subaru boxer remains a niche model.

² In this context, copyleft would be the practice of using copyright law to offer the right to distribute copies and modified versions of a work of software and requiring that the same rights be preserved in modified versions of that software.

³ The term 'mobile device' refers not only to smartphones (or feature phones) but also to tablets, laptops, desk-based personal computers and other such devices in which platforms can be installed.

business models, facilitating and driving the creation of new products and services [25]. The platforms also allow company–user and user–user modes of collaboration [4], which fosters mutual learning and knowledge. As Fig. (1) indicates, the knock-on effect of this process on the network is that knowledge becomes more widely shared as the number of users increases. Advertisers, content providers and other players also benefit from the direct effect on the supply of complementary services and products.

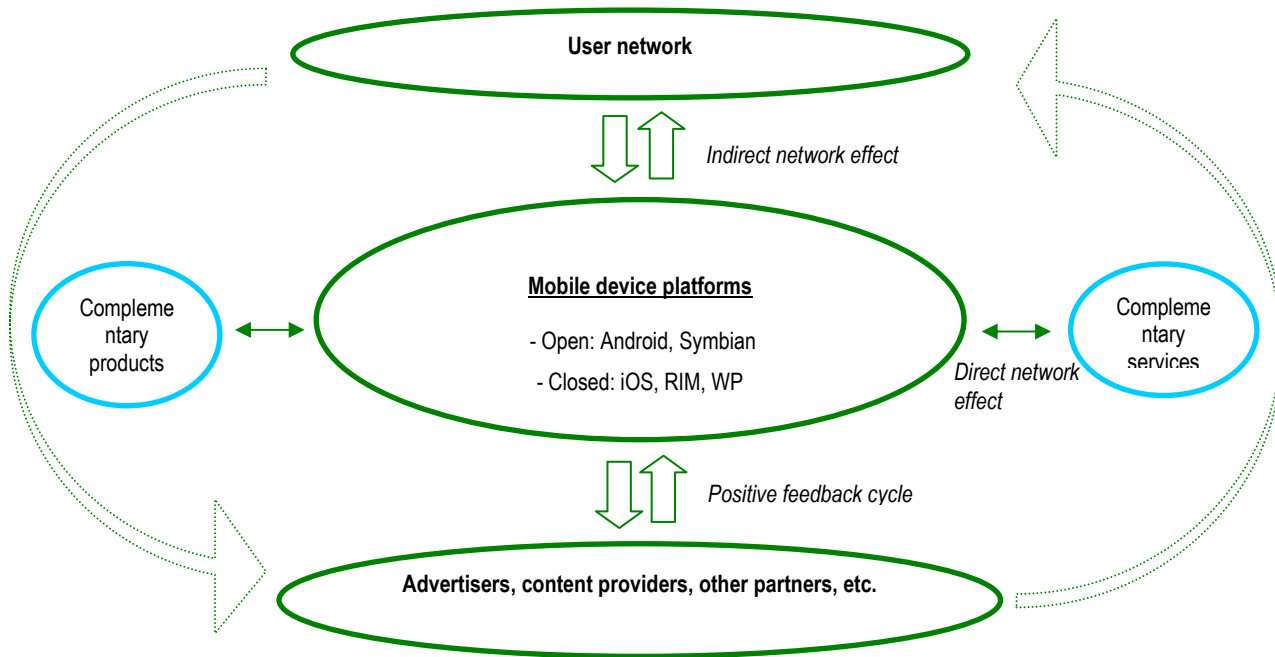


Fig. 1: Platform dynamics - adapted from [31]

Platform dynamics show us how the user’s role changes and how users can become an active operant resource in the design process [6,32].

2.3.- TOWARDS AN INTER-COLLABORATIVE MODEL FOR DEVELOPMENT IN MOBILE DEVICE PLATFORMS

The mobile operating systems market is currently divided between the five main platforms Android (Google), iOS (Apple), Blackberry OS (RIM), Windows Phone (Microsoft), and Symbian (Nokia), even though the Symbian platform is experiencing a period of decline. Of these, Android and Symbian are open-source platforms whose source code users can modify and even distribute. [33] observe that servitization occurs differently in open and closed platforms and conclude that while the former prioritise greater flexibility, the latter focus on exclusive and specific service delivery to the end user.

Recent data suggest that Android controls approximately 51% of the US smartphone market share, followed by iOS (almost 32%), and RIM and Windows Phone, whose shares have both fallen (11% and 4%, respectively) (comScore data, July 2012)⁴.

	Android	iOS	Windows Mobile	Symbian	RIM
<i>Firm(s)</i>	Open Handset Alliance	Apple	Windows	Symbian Foundation	Blackberry
<i>App store</i>	Google Play Store	App Store	Windows Marketplace	Nokia Store	Blackberry App World
<i>Available apps</i>	>600,000 -60% free-	>500,000 -30% free-	30,000	25,000	100,000
<i>Software license</i>	free	licensed	licensed	free	licensed
<i>Age of platform</i>	young	adolescent	young	mature	mature

Table 1: Comparison of the five main mobile device platforms - adapted from [34]

The Linux-based operating system Android is presently being developed by the Open Handset Alliance, the consortium of companies led by Google and devoted to advancing open standards and writing applications to extend the functionality of mobile devices, while Apple Inc. does not license iOS (originally developed for iPhone but then also used in iPod Touch, iPad y Apple TV) for installation on non-Apple hardware and iOS users can only install software from the app store. Microsoft's Windows Mobile was designed to have the look and feel of the Windows desktop and, finally, Symbian was the product of an alliance between mobile phone companies that included Nokia, Sony Ericsson, Psion, Samsung, Siemens, Arima, Benq, Fujitsu, Motorola, and Sharp. Symbian was designed to create an operating system for mobile devices that could compete with Palm OS, Microsoft's Windows Mobile 6.x and Android, iOS and RIM (see Table 1).

Closed applications go together with hardware manufacturers (e.g., Apple's iOS goes together with iPhone architecture and, albeit with modifications, with Apple's remaining products, and the same applies to RIM). Microsoft has chosen a platform that can be adapted to different manufacturers (like its operating system Windows X) while Android, which Google bought from its original developer, emerges as the most versatile platform (and does not have its own hardware manufacturer). In fact, four of the five smartphone manufacturers who control practically 100% of the market share use Android, even though some manufacture devices for more than one platform (the five firms are Samsung, at 25% of the market share, LG at 19%, Apple at 15%, Motorola at 12% and HTC at 6%⁵). For the customer the use of one platform goes together,

⁴ ComScore also observes that Symbian maintained a 1.5% share in old devices under the Nokia–Microsoft agreement to incorporate Microsoft's Windows Phone in Nokia's smartphones.

⁵ Source: comScore Mobilens for the US market.

sometimes obligatorily and sometimes optionally, with the creation of an account in the firm's distribution platform or apps store (e.g., Google Play Store for Android and Apple Store for Apple iOS).

Business opportunities in closed platforms are based on the licenses made to hardware manufacturers, as in the case of Windows Phone, and on the income generated by apps stores. In the case of iOS and RIM, income goes together with the sale of the company's own device. But in the open platforms, especially in Android, the OSS structure allows for a high level of flexibility and a multitude of business opportunities not only for platform developers, hardware manufacturers and carriers but also for product and service suppliers. In other words, it allows for a wide-reaching servitization model (see Fig. 2) which, at present, businesses are still not fully exploiting. In the open model, the platform developer offers users the chance to modify the core or central platform, and then hardware manufacturers (original equipment manufacturers or OEMs) and carriers make modifications which frequently include captive apps — i.e., modifications that cannot be uninstalled from the modified platform — in order to optimise the use of the hardware and be able to servitize more effectively by offering other products and services (e.g., Samsung with Samsung Apps). These modified platforms are called ROMs from the acronym (read-only memory) that identifies the base operating systems.

There is, therefore, a dividing line on the central platform that separates stock ROMs from custom ROMs. On the central platform other developers can create custom ROMs equipped with features that are specific to the mobile device. Many are designed for a specific device and many others are multi-device. Degrees of compatibility are also established, which means that universal non-captive apps (i.e., independent or third-party apps rather than apps written by a closed system of carriers and OEMs) can be installed in any ROM but that there are apps which cannot be installed in stock ROMs (superuser apps) and apps that can only be installed in custom ROMs. At the present time, manufacturers and carriers create barriers with stock ROMs by withdrawing users' superuser status and privileged OS control and by limiting their control of certain apps on the platform. In fact, at the time of writing over 90% of mobile devices use stock ROMs as these were originally shipped from the manufacturer. And although the process of rooting (overwriting stock ROM with custom ROM) is not complex it still requires certain specialist knowledge and its advantages have remained clouded by some users' perception of rooting as an irregular if not illegal activity and by the fact that manufacturers and carriers will not guarantee rooted devices.

However, the flexibility allowed by technological advances is steadily lowering the barrier between stock and custom ROM, and this is where the opportunities for

servitization are experiencing exponential growth, the number of apps growing at a rate that makes it difficult for firms to give new apps visibility on the basis of servitization. In fact, users constantly install and uninstall apps. For this reason, custom ROMs can generate very complete experiences of servitization for the customer because, at least for the moment, there is so little competition.

The main advantage currently offered by the open platforms is that users can create custom ROMs without entering restrictive partnerships. However, agreements between closed platform manufacturers and developers have also been profitable, as the Nike–Apple partnership Nike+iPod shows, and such partnerships can also be made possible on open platforms in specific agreements between manufacturers and carriers. These can be developed further when various ROMs are incorporated in one device so that users can use one or another ROM with practically the same ease they have with apps. This, essentially, constitutes the new collaborative environment described in Fig. (2), where apps and ROM developers can collaborate to optimise the servitization process and where, in a manner unimagineable only a few years ago, the global context allows firms to reach remoter regions at a very little cost.

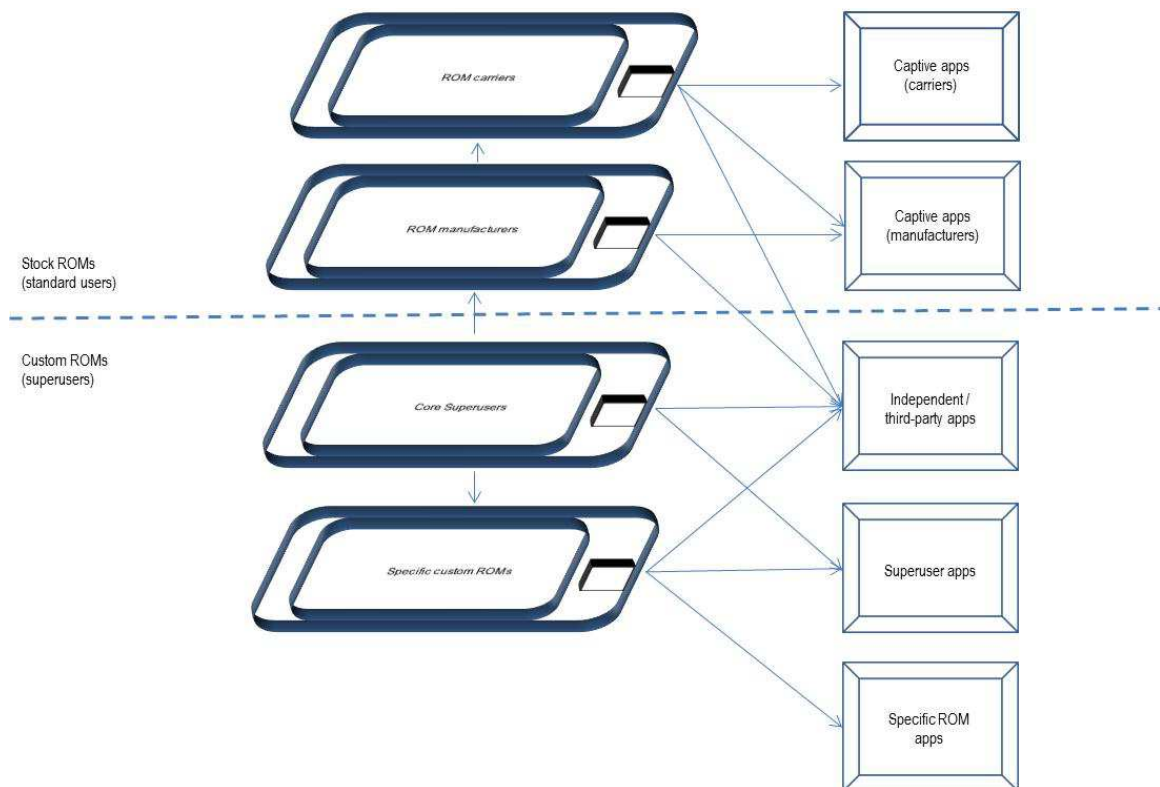


Fig. 2: Development model for ROMs and apps

3.- RESULTS

It is clear that smartphones have revolutionised the mobile phone market, that sales will go on increasing and that the expansion of Android during this last year, the decline in Symbian sales and the Nokia–Microsoft partnership have all intensified the highly competitive environment of mobile device platforms.

Business opportunities based on servitization can be generated from the greater presence of corporations on open platforms and from the creation of more specific partnerships for captive apps and even mixed ROMs on closed platforms. Given the speed of IT and the difficulty of forecasting where users will be most likely to go or which apps or ROMs will obtain the widest distribution, firms are inclined not to commit to just one platform. Finally, we may also see the development of new IT platforms integrating other devices into the market, such as televisions or cars.

The first corporations to move will also have a clear competitive advantage. The thematisation of ROM and apps together with the notion of customer satisfaction as added value will be key in the rapid extension of the servitization process, as will the interaction between custom ROM and app developers. Corporations will need to identify differences in user life style and purchase habits from one type of platform to the other. For example, although the open platforms are currently more flexible, customers can only take full advantage of them if they have a certain degree of technical knowledge about the device they have purchased. The closed platforms, by contrast, allow businesses to make use of captive apps that the user cannot uninstall from their device and that, therefore, provide the means to maintain a longer-lasting process of servitization.

In order to completely integrate the model, manufacturers and carriers will need to facilitate the more simple procedures and protocols for installing ROMs and establish synergies (as the mutually beneficial results of the Nike–Apple partnership have demonstrated, for example). Technological vigilance will be essential here, given the attractiveness of the market and the potential entry of new standards, (e.g., Firefox's most recent standard). This will become more important when advanced ITs (e.g., near-field communication or voice-recognition) become more systematically integrated in new ROMs and apps.

4.- CONCLUSIONS

This paper makes a case for harnessing the series of practices known as servitization to the rapidly developing IT industry by integrating these practices in mobile device platforms, where they can create direct channels for company–customer communication.

The last five years have seen major growth in the network economies, which are redefining not only the telecommunications industry but also the manner in which individuals and organizations interact. Technology platforms have become the instrumental vehicle between the Internet and mobile network operators, and the survival of those platforms depends upon the developers, the services they supply and the content providers. In the last two years, a notable number of users have made the change from feature phone to smartphone or to another similarly advanced mobile device. At the same time, however, it is the platforms themselves that set the pace for market development, rather than the hardware. This can be seen in the literature's use of the term 'mobile ecosystem' to refer to the number of applications that 'give life' to the platform and it should also be noted these ecosystems are the perfect arena for the implantation of servitization strategies.

The model in this paper presented in the categories of captive apps (OEM- and carrier-developed) and non-captive apps (independent- and third-party-developed) and stock and custom ROMs provides a technological frame of reference for decision taking in corporate servitization. In this way, the collaboration between firms and ROM and app developers becomes the lynchpin for implementing servitization strategies.

Future lines of research will need to use specific methods and tools to analyse the protocols oriented to guaranteeing success in servitization processes on mobile platforms. Understanding and defining these processes and their role within the business supply chain will also be essential.

Finally, we must consider that in all probability no single open or closed platform will monopolise the market. On the contrary, there appears to be a trend towards a division between 'premium' users of iOS and 'common' users of Android, with the remaining markets generally providing minority offerings.

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