# Business Models for Networked Media Services

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## ABSTRACT

In this paper we consider business models for networked media services, i.e. services that enable users to share interactive media experiences across multiple domains. We start from the applications and services provided by an enabling service platform for cross-domain networked services. In particular we derive a generic value network for service offerings enabled by the platform and consider the required business roles. We find that different business configurations may arise, i.e. different mappings of actors on, as well as clusters of business roles. The configurations have a varying degree of openness and different focal actors, i.e. operators, device manufacturers or service providers. Also a roadmap is considered for the transition from currently single domain towards future cross-domain configurations. Customer demand and economies of scale and scope are driving an increasingly open cooperation between operators, service and content providers, and device manufacturers towards a service centric model.

## Categories and Subject Descriptors

K.6.0 [**Management of computing and information systems**]: General – *economics*

## General Terms

Management, Economics.

## Keywords

Networked electronic media, business model, value network.

## 1. INTRODUCTION

In a perfect world, networked electronic media enables individuals and groups of users to share their interactive media experiences in an intuitive and seamless manner, regardless of their choice of device and networks. However, today's landscape of networked electronic media consists of a number of non-interoperable technology islands that were designed for different types of users, services, content, and devices. Examples are the consumer electronics devices in the home and different kinds of network and service environments for mobile, IPTV, and broadcast usage.

The goal of the European 7th Framework project iNEM4U (Interactive Networked Experiences in Multimedia for You) is to design, prototype and evaluate a distributed service infrastructure that supports these goals [1]. Obviously technical challenges revolve around solving interoperability issues and bridging hitherto separate technology domains such as Web 2.0, IMS, Peer-to-Peer and IPTV services. However, apart from the technical challenges also complex business issues exist, for example with regard to the required (re-)configuration of the value network and with the design of viable business models that support converged cross-domain services [2]. In the networked media arena players from multiple domains can compete and/or cooperate in providing fairly similar converged services [3,5]. In this paper we consider business models for converged electronic media services which can be enabled by the iNEM4U service infrastructure. We see a business model as a description of how a network of cooperating organisations intends to create and capture value from new, innovative services and products [2,4]. We base our analysis on a user scenario that shows the possibilities of new cross-domain services and applications enabled by the iNEM4U infrastructure. This paper addresses the business logic of the iNEM4U infrastructure from the perspective of platform business models [2,3]. It provides configurations of the value network for new cross-domain networked media services that iNEM4U enables, and additionally, a roadmap is considered for the transition from currently single domain towards new cross-domain configurations.

## 1.1 Research approach

First we describe a user scenario that shows new cross-domain services and applications enabled by the iNEM4U infrastructure and identify the high-level business innovations. Next we present a generic value network model that is capable of providing the new services and applications that are described in the scenario, taking the business logic into account. The generic value network model depicts the core business roles that are required, as well as the main service and product exchanges between them. Based on the generic value network, desktop research and on interviews with business representatives, we define business configurations, i.e. combinations of business roles in clusters, and a mapping of these clusters to specific actors. A business configuration therefore shows which actors fulfil the business roles in the value network. The configurations differ in two important ways. First, with regard to the kind of clustering, i.e. predominantly closed models where one single actor plays all business roles versus open models where the business roles can basically be played by any capable actor. Secondly, different types of actors may fulfil the same roles, notably operators, service providers and manufacturers. Finally, for the defined business configurations, we consider a roadmap that shows how the transition towards value networks for cross-domain solutions may take place.

## 1.2 Scenario description

To visualise the possibilities of new applications in the iNEM4U domain, a scenario has been developed based on input from end-users and domain experts. The scenario named "OurEvent" is written around a jazz concert, and has been divided in three phases: pre-event, event and post event. Cristian and Pauline have purchased tickets for the concert, Andrew is on a business trip and will watch the concert from his hotel room and Mary is at home.
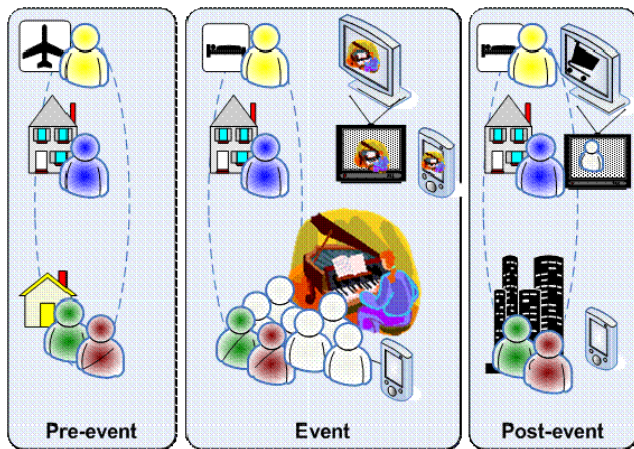


**Figure 1. OurEvent scenario**

Because Cristian and Pauline have purchased tickets for the concert, they are invited to join the concert community, set-up by the Concert Organiser. The concert community offers visitors a platform where they can share information and experiences. The concert community can be accessed through Cristian's and Pauline's personal portal, which is their main entry point for accessing media and communication services. The concert community and the personal portal are both personalised and accessible from every end-users' networked device (mobile, TV, tablet-PC…).

When the concert begins, Andrew and Mary are watching the concert in a shared session - Andrew on the hotel TV, and Mary on her TV at home. Cristian and Pauline join the session and add video footage from their mobile to the session. During the concert, Andrew and Mary can view the videos made by Cristian and together they share their comments on the performance. The Concert Organiser has allowed (granted rights) for audiences members to film the concert and distribute it.

After the concert, all four of them receive advertisements which take into account their context and personal preferences.

The OurEvent scenario covers two main business innovations. The first business innovation relates to horizontalisation of the market, i.e. iNEM4U technology will enable and support the shift from traditionally (closed) vertically integrated structures to more open interoperable structures with 'service modules' collaborating and competing on each layer, enabling cross-domain services.

The second main business innovation stems from the cross-domain collection of context and profile information that iNEM4U provides. This information is a clear business asset as it aggregates hitherto separate sets of personal data into rich cross-domain user profiles. The aggregated profiles can be used for context based (near) real-time content and service blending, e.g. in shared sessions.

## 2. RESULTS

## 2.1 Generic value network

In this section we introduce the value network of the OurEvent scenario, which embeds the generic value network for iNEM4U-enabled services, i.e. the network of business roles necessary to provide the new applications and services described in the scenario. Figure 2 shows the value network with the business roles required to deploy the services as described in the OurEvent scenario. Together, the dark coloured business roles compose the generic value network.
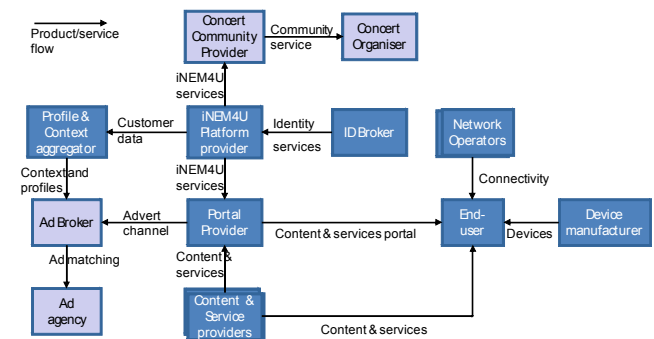


**Figure 2. Value network**

The Portal Provider provides end-users an entry point to cross-domain services and offers personalised service navigation, messaging and communication services. Possible revenue streams may come from Ad brokers, Profile aggregators or directly from end-users. Industry experts consider the personalised portal that gives access to iNEM4U-enabled services and is controlled by the end-user as a key success factor [6].

The Platform Provider deploys the iNEM4U infrastructure and provides enabling services to the Portal Provider and other service providers. As a platform it should focus on economies of scale,

and offer service providers a standardised set of high-level interfaces that provides easy to use access to a modularised architecture. Revenues may come directly from the Portal and service providers who make use of the platform, e.g. providers focusing on the creation of ad hoc communities, such as the Concert Organiser in the OurEvent scenario. Another revenue source for the Platform Provider is to leverage the customer data collected via the iNEM4U infrastructure and offer it to a Profile & Context aggregator.

The Profile and Context aggregator offers aggregated customer data to third parties, e.g. for personalised advertising. The success of collecting customer data is based on transparency and for leaving the customer in control of its profile and context data.

Both the Identity and Advertisement Broker can be considered new business roles in the context of cross-domain services, and will be discussed in the next sections.

### 2.1.1 Identity Broker

The Identity Broker (ID Broker) provides cross-domain identity management services, i.e. authentication services, including single sign-on, and secure access management to personal information and profiles across services and domains. In single domain services, a single Identity Provider (ID Provider) provides the identity management services, and thus this role can be taken by one of the service providers. In a cross-domain iNEM4U world however, where many different entities and domains are supposed to collaborate to provide end-users with services, an ID Broker which correlates different identities stored and managed by different ID Providers in individual domains, is required. As this role should be independent of services and domains, considering the ID Broker as a separate business role is essential in future environments involving open cooperation between operators, service- and content providers, and device manufacturers in a service centric model (see Section 2.3 for a detailed roadmap). Although the role of ID Broker is considered as a new independent business entity, due to the fact that the ID Broker needs to be well-trusted, the most likely assumption is that an entity which already has trust in the world, such as a telecommunication operator, will initially take this role. Newcomers might be able to step in once they have gained the necessary level of trust.

### 2.1.2 Advertisement broker

The Advertisement broker (Ad broker) role is one which is introduced by the iNEM4U platform in order to manage the complexities of delivering effective advertisement to users, across domains. The opportunity for new advertising models and revenue streams provided by the iNEM4U platform can only be realised if the advertisers are willing and able to make use of the new capabilities. The Ad broker lowers the barriers for advertisers to leverage those new capabilities.

The Ad broker acts as an interface between the advertising agencies (or directly with the advertisers) and the iNEM4U platform. He abstracts the complexities of cross domain delivery, profile schemas and context taxonomies, allowing advertisers to implement campaigns using the language they are familiar with, rather than having to learn the one of the iNEM4U platform.

The functional role of the Ad broker is the fulfilment of 'placement requests' and the feedback of usage data. The process

of placement request fulfilment refers to the execution of a specific advertising campaign, requiring the Ad broker to deliver adverts to the appropriate channel, at the appropriate time and to the appropriate user, based on the context and profile specified by the set of rules from an advertising agency.

The second functional role for the Ad Broker is usage feedback. This is the process of collating advert delivery, click-through and fulfilment rates and providing aggregated and auditable reports back to the advertisers. The auditable nature of the reports is essential as they form the basis of the charging mechanism between the Ad broker and the advertiser.

## 2.2 Business configurations

In this section we discuss three business configurations for the iNEM4U value network. With business configuration we mean a clustering of business roles and mapping of actors' responsibilities to these clusters. Business configurations, together with the detailed value network, business role descriptions and the revenue flows, specify applicable iNEM4U business models [6]. Some of their properties are discussed in the text below. Based on [2,4] and the generic value network and on interviews with business actors [6], we derived three main business configurations: *Operator Centric model*, *Device Centric model* and *Service Centric model*. The names refer to the kind of actor which is dominant in the value network. All three configurations already exist, however in a fairly closed form, e.g. today's walled and semi-walled garden approaches used by operators, Apple's ecosystem around the iPod and iPhone, and Microsoft's community services via web and mobile. As iNEM4U advocates an open approach we'll focus on open variants of these business configurations.
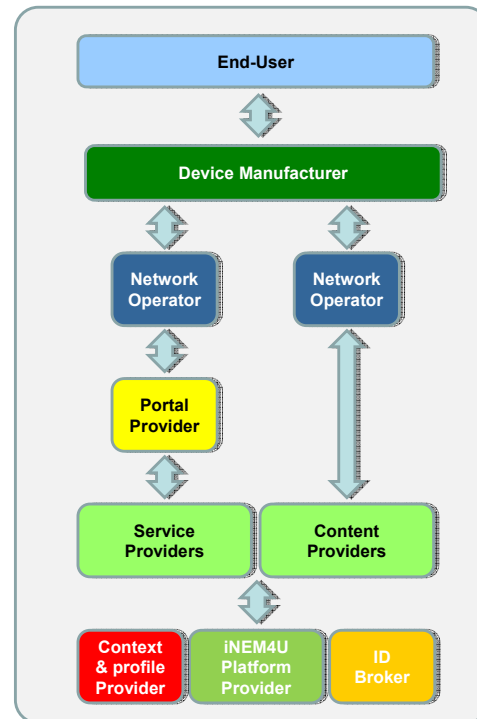


**Figure 3. Service Centric Model**

The *Operator Centric model* targets network operators and broadcasters and their business requirements. In the *Operator Centric model* a consortium of operators, e.g. an existing triple- or quad player and/or combination of single domain operators, fulfils the roles of Platform Provider, Context & Profile Provider and Identity Broker.

The *Device Centric model* places an onus on the device manufacturer to deliver a new iNEM4U capable device, an initial portal through which content may be delivered, and the platform necessary to provide the iNEM4U services. In many cases the portal will be developed and operated by the device manufacturer, as without it the device would have limited features. The portal catalyst approach is adopted by a number of device manufacturers today, however only a few extend this to employ an open portal which can be replaced by third parties subsequently.

The *Service Centric model,* illustrated in Figure 3, adapts the open Internet model to the mobile and TV domain. It provides end-users total freedom to choose from the various Network Operators to create a personal set of services. These services can be accessed either directly or through one of the Portal Providers available. The complete model is designed to create an open ecosystem where end-users have true freedom of choice regarding services and content and the entry barrier to introduce new services is low.

## 2.3   Roadmap
In the final part of this section we consider a roadmap for iNEM4U, i.e. how today's more closed business models might evolve towards more open models, see Figure 4. At first, cross-domain solutions maybe limited and provided by single providers in a relatively closed model ('Single provider phase'). However, customer demand and economies of scale and scope are driving consortia formation ('Consortia phase'), and an increasingly open cooperation between operators, service- and content providers, and device manufacturers towards a service centric model ('Horizontalisation phase').
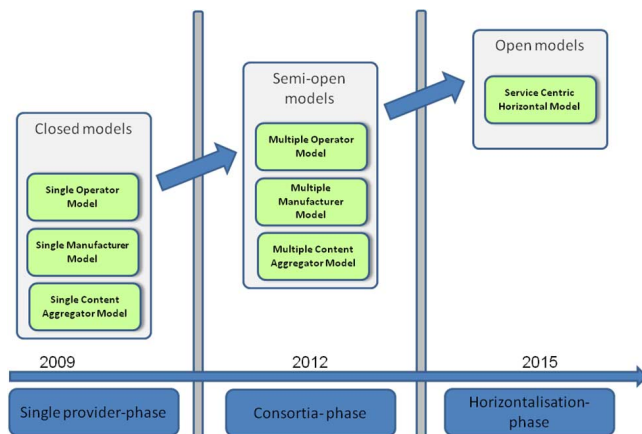


**Figure 4. Roadmap for iNEM4U business models**

A service roll-out and collaboration involving a consortium of operators and service- and content providers could be realised in several ways, as suggested by Figure 4, i.e. (1) rolling out *a full-blown service portfolio* provided by the predefined consortium,

and after that inviting the 3rd party service providers, (2) mobile operators starting quickly with *a limited service offer*, establishing a service eco-system and the mechanisms for collaboration with other business actors (technical and business interfaces, service level agreements and specifications, mechanisms and APIs for third party service access, mechanisms for content and context delivery), and inviting them to contribute later, when these mechanisms are in place.

## 3.  CONCLUSIONS
Rather than defining a single definitive business model, service platforms like the one researched in iNEM4U support a set of co-existing and cooperative models that fulfil the business requirements of particular partners. A single, all-encompassing model is likely to be both unwieldy to describe and implement. The business models vary from closed to open models, and with different actors in the lead, i.e. operator, device or service centric models. At first, cross-domain solutions may be limited and provided by single providers in a relatively closed model, but customer demand and economies of scale and scope are driving consortia formation, and an increasingly open cooperation towards a service centric model. The open model creates new business roles such as the Identity Broker and the Advertisement Broker. This provides opportunities both existing and new players.

## 4.  ACKNOWLEDGMENTS

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