Web Systems - Assignment

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Contents

1 Overview (~500 words)

mymuesli is a German company founded in 2007 that sells custom-mixed muesli by post in four European countries. This paper uses *mymuesli* as a case study of how the Internet and information systems (IS) have the capacity to transform every part of the enterprise, and indeed to be integral to how it achieves its objectives.

1.1 e-Business models

Papazoglou and Ribbers (2006) define an e-Business model as "descriptive representation of the fundamental components of a business that operates partially or completely on the Internet". Using the authors' classification system for such models, we can see that *mymuesli* is an 'Internet-enabled' business and falls specifically within the business-to-consumer (B2C) category of 'e-Shop' proposed by (Timmers 1998).

The company produces a 'niche' product which may have been prohibitively expensive to sell and distribute prior to the Internet. By operating as an e-Shop, *mymuesli* gains a "low-cost route to global presence" (Timmers 1998), meaning that company has the potential to be profitable selling its product direct to consumers around the world without intermediaries and the need for significant economies of scale. Another way of putting this is to say that the Internet allows manufacturers to "compress the distribution channel" (2010).

On the other hand, although the Internet makes the physical distance between *mymuesli* and its customers less of a problem, it creates other kinds of challenges, such as increased competition and the relative ease with which a customer can abandon their 'shopping basket' and buy from a competitor instead. There is also an increased need to focus on online marketing and search engine optimisation (SEO) to ensure that customers find the product in the first place.

It is noteworthy that since 2012 *mymuesli* has also operated two physical stores in Germany (mymuesli GmbH 2017), putting it in an unusual category, along with others such as Amazon (McCarthy 2017), of a company that initially only operated online but later opened high street shops and raises the question (originally framed around traditional retailers embracing the web) of finding the right "mix of bricks and clicks" (Gulati and Garino 2000). One goal of this stategy is be to build customer awareness of the brand and provide more promotion opportunities.

Furthermore, should *mymuesli* enter the hotel market its business model will also encompass business-to-business (B2B) sales. The idea of allowing a hotel chain to offer a custom breakfast "by mymuesli" is an instance of 'co-branding', which not only exposes *mymuesli*'s offering to a wide range of potential customers but also "enhances the credibility of the hotel's brand by borrowing credibility from other brands" (Yip 2005). Combined with an Application Programming Interface (API) for receiving and fulfilling hotel orders, this would represent a foray into a Value Web-type e-Business model based on inter-company-relationships that exploit the possibilities of new technology (Papazoglou and Ribbers 2006).

1.2 Role of information systems

Information systems now have an increasingly large role to play in most businesses. An information system (IS) can be defined as "a set of interrelated components that collect, manipulate, store and disseminate data and information and provide a feedback mechanism to meet an objective" (Stair and

Reynolds 2014). For a company that manufactures a physical product such as *mymuesli*, the use of computer-based information systems (CBIS) will be an essential way of ensuring that the objective is realised, specifically the generation of a profit.

(change quote, describe use of data and 'system')

1.3 Impact of web technology

(overview of web technologies; evolution of web to back-end/internal systems)

2 Solution architecture: mymuesli (~3000 words)

2.1 Common concerns

2.1.1 Business process modelling

Business process modelling is a form of analysis that describes the dynamic activities performed by a business. One objective of creating a process model is to gain insights into how a business operates, which once validated can be used during the design phase of an information system to assist in the creation of further artefacts such as a data model (van der Aalst and Stahl 2011). For example, when a customer is ready to place an order with *mymuesli*, the company must acquire the user's postal address in order to know where to dispatch the order to when ready, either by retrieving it from information system storage if the user has previously logged in or asking the user to provide it at checkout. This entails that any data/object model for the customer must include all required address information.

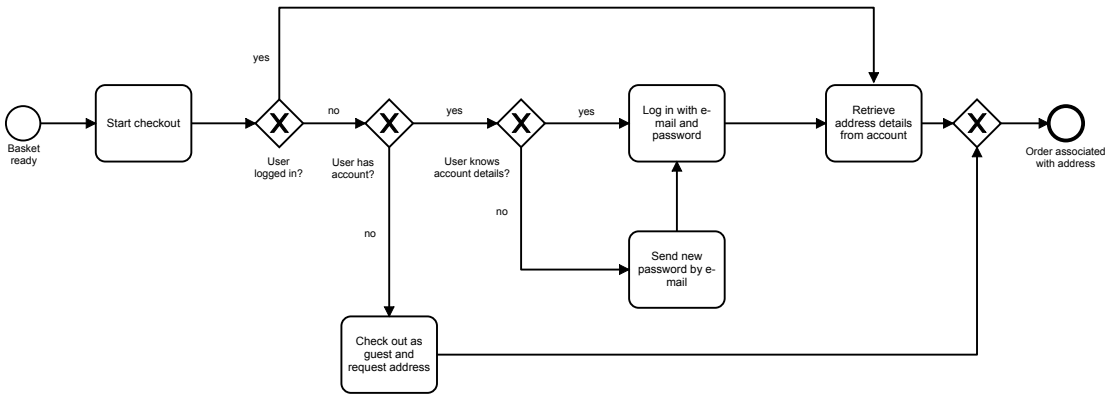

Figure 1: Business process for associating an address with an order in BPMN

There are a number of normative visual languages available for describing businesses processes. One example of these is Business Process Modelling Notation (BPMN), which uses defined symbols for events, tasks, flows and gateways to model business processes. Figure 1 shows such a BPMN diagram representing the process for a postal address being associated with an order. Although BPMN has some similarities with the UML activity diagrams familiar to many working in software development (OMG 2017), one aim of BPMN is to be intelligible by a wide range of business users and not just developers

(Papazoglou and Ribbers 2006). On the other hand, one weakness of BPMN in contrast to earlier approaches such as 'classical' Petri nets is its lack of formal semantics in some areas, meaning that BPMN diagrams "typically lack the precise mathematical basis that is required to render them really unambiguous" (Kossak et al. 2014). Even with this caveat, it remains a useful high-level tool for intra- and inter-business communication.

2.1.1.1 Identifying the business scope

Papazoglou and Rivers (2006) suggest that, by making 'business rules' visible, business process models make it easier for companies to adapt in changing market conditions. This advantage is likely to be of particular relevance to retailers such as *mymuesli* that operate primarily in the rapidly-changing online environment.

In order to employ a systems approach to modelling business, a necessary first step is to identify the system boundary. An analogous step is required in the Unified Process, where the requirements analyst must determine what is part of the system (i.e. inside the system boundary) and what is in its environment before use case modelling can begin (Arlow and Neustadt 2005). For the current study, the system boundary encompasses the *mymuesli* online shop, the manufacturing process ...

2.1.1.2 Process management software

(mention reasons for using it/integrating with it; idea of executable models; MDA?)

2.1.1.3 Specifc process challenges for mymuesli

(Seven wastes of lean: inventory; waiting) (https://en.wikipedia.org/wiki/Muda_(Japanese_term))

2.1.2 Outsourcing and Cloud computing

(different levels of outsourcing; IaaS vs SaaS; 'undifferentiated heavy lifting')

2.1.3 Security

2.2 Web front-end

2.2.1 Functional characteristics

(search, shopping basket, registration)

2.2.2 Device and platform support

2.3 Order management and payment

2.4 Manufacturing

2.4.1 Purchasing

2.4.2 Storage

2.5 Shipping

2.6 Business-to-business

2.6.1 Semantics

(brief treatment of ontologies; semantic web)

2.7 Other functions

2.7.1 Accounting

2.7.2 HR

3 Detailed technical investigation: distributed microservices (~1000 words)

3.1 Evolution of web services and service-oriented architecture

3.2 Challenges of distributed systems

3.3 Analysis and design of microservices

3.4 Virtualisation and containerisation

4 Conclusion (~500 words)

4.1 Applications of problem to BBC

4.2 Suggestions for further work

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