

4) The life cycle of a product

Product deployment/launch

One of the important stages of **the final phase of a project is the preparation of the deployment/launch of the resulting product**. To put it simply, the end of life of a project marks the beginning of the life of the resulting product, ie its **entry into operation** (which may be commercial or not).

In actual fact, the product is in gestation throughout the life of the project.

As mentioned previously, in the case of a commercial product, the PM is often involved in helping Marketing & Sales with the product launch preparation and sometimes the launch itself.

Product evolution

The first version of a product that is supposed to evolve over time results from the **"initial project"** (or "base project") and each of the following versions generally requires a specific new **"follow-on project"**.

This is generally the case for a "massive" change or enhancement of a product's content, as well as for new releases of the software (corrective releases, update releases, major revisions...).

If it is possible to imagine from the outset what the **successive versions** of the product will be, then their features and constraints should be **integrated into the initial project**, in order to make the execution of corresponding follow-on projects easier, to increase their chances of success and to minimize their cost.

Products, in particular software, generally require **maintenance**, which may be provided on an ongoing or occasional basis, as specified in a maintenance contract if software development is subcontracted by the project owner. Depending on the context, the cost of maintenance may be explicitly charged by the contractor to its client or included in the overall "price" of the project invoiced to the client.

In some cases, product maintenance is treated as a follow-on project.

A version of a product may be distinguishable from the previous version by nothing more than an **evolution of its content**, with no change to the software. In this case, the making of a new version of the product should not require a new development project but the application of a **process** that has been specified and implemented as part of the initial project.

For the Hachette Multimedia Encyclopedia ("EHM") on CD-ROM (and DVD-ROM), it had been decided that users would be given the option of downloading content updates on a monthly basis. This function was featured in the specifications, so the developers devised a mechanism for updating the EHM content, initially delivered on the CD-ROM, with data downloaded to the user's hard disk from a dedicated website. The software process for content update was thus automatic. That process was also applied for updating the EHM software itself (for minor bug fixes).

The latest version of the online EHM was complemented with a sophisticated "back office", including a chain of software applications to extract new data (additions or updates) from the (Oracle) database, and to index, reformat and upload the data to the EHM website.

Thanks to that almost fully automatic process, which had been specified as part of the initial project, editors were able to trigger an update of the online EHM, usually on a weekly basis, without requiring any intervention from the developers.

As a general rule, and in particular for a website, the initial project should include the design and development of a set of administration and editing tools, sometimes called "**back office**", which will in particular enable the people in charge of the product's content (editors, etc.) to update it without having to bring in technical specialists.

Specifications of the back office need to be prepared in close cooperation with its future users so that the tools that are developed perfectly meet the editors' needs and make the tasks of content addition and updating simple and efficient.

Marketing & Sales sometimes require **demonstration versions or "light" versions** (reduced versions) of a product.

If this requirement is integrated into the initial project, additional projects corresponding to these "**by-products**" will generally be simple, short and inexpensive.

With promotional operations in mind, Hachette Multimedia's Marketing had asked for special versions of the EHM featuring content limited to one or several topics (Art, History, Science and Technology, etc.) and software limited to a subset of the product's functionalities.

That specific constraint had been specified in the initial project and was taken into account by the EHM software developers. As a result, each of the required EHM by-products could be made at a very low cost within just a few days.

End of life of a product

All good things generally come to an end, even products!

The end of a product is an integral part of its life cycle and should be taken into account in the corresponding project.

The end of a product is characterized by the fact that it becomes "**frozen**": its content and its software will no longer evolve. However, this does not necessarily imply that the commercial operation of the product needs to be stopped immediately.

The Hachette Multimedia Atlas (AHM) and the Hachette Multimedia Dictionary (DHM) on CD-ROM were frozen in 2001 and 2002 respectively on the occasion of the production of the AHM's 6th version and the DHM's 8th version.

Marketing had however decided that these products would stay in Hachette Multimedia's catalog for as long as they could be sold. The products were repackaged, without any reference to a specific year of release, and their recommended retail price was progressively dropped to the equivalent of 19.90 euros.

The AHM and the DHM thus remained on the market for many years after the effective end of the product (from its producer's perspective). It even turned out necessary to manufacture several hundreds of AHM CD-ROMs in the first half of 2007 in order to meet customer demand!

The final version of the Hachette Multimedia Encyclopedia (EHM) on CD/DVD-ROM, the EHM 2007, was produced in June 2006. In order to extend the product's life as long as possible, its software was made compatible with the new Macintosh computers featuring Intel Core Duo processors.

The EHM 2007 remained in its distributors' catalogs for as long as there was demand, and as long as salespeople did not consider the product to be totally obsolete.

Marketing did not want to remove the mention of the date ("2007") from the EHM box (as I had recommended...), so its obsolescence became apparent as soon as the "2008" versions of its competitors (the Larousse Multimedia Encyclopedia and Microsoft Encarta) were released on the market.

Despite this major disadvantage, the EHM 2007 could still be found on retail store shelves in 2008 and could still be purchased online throughout 2009...

The **decision to freeze a product** may be made for various reasons, for example: its maintenance cost is judged to be too high; its evolution is made impossible because its original developers are no longer available, and having its software taken over by new developers would be too risky and too expensive; the decision to produce a brand-new replacement product has been made.

Once a software application is frozen, any **technical incompatibility** with its environment (which never ceases to evolve...) leads to problems for users and therefore for whomever is in charge of the frozen product (its original project owner, its product manager, its publisher...).

It is essential to figure out and plan how to deal with such problems. The PM is often involved in devising solutions, in close cooperation with the appropriate stakeholders, eg Marketing & Sales, in particular the product manager and Customer Services.

If another product can be substituted for the faulty product, the solution is simple, though it may be costly (eg for the manufacturing and shipment of the replacement product).

A more cost-effective solution that may be satisfactory for a large proportion of users consists in proposing an online product as a **replacement** for an offline product that has become unusable.

There was a network version of the EHM CD/DVD-ROM that encountered technical problems in a growing number of configurations. The cost of solving the problems being considered too high with respect to the volume of sales of the product, I decided (with the approval of Marketing & Sales) to discontinue the network version of the EHM, following its 9th version dated "2006".

The few customers (less than a dozen) who had reported major problems with the network version of the EHM 2005 and 2006 were satisfied with being provided, free of charge, with a stand-alone EHM 2007 DVD-ROM that could be fully installed on each of the user workstations, or with a free subscription to the online EHM (which had the advantage of being frequently updated).

If there is no available replacement product, customer complaints may require **refunding** the faulty product at its purchase cost.

It is wise to document in a very explicit manner on a product's packaging the **configuration required** for a product to work properly. Doing that may avoid having to refund a product that does not work with a configuration not included in the description on the box.

Some Hachette Multimedia products worked properly with Mac OS 9 but not with Mac OS X. The explicit warning "Does not work with Mac OS X", which I convinced Marketing to print on the boxes, avoided refunds (but not necessarily discontent of customers who had not paid enough attention to the configuration section on the back of the packaging...).

If the **termination** of a subscription-based online service is considered, it is essential to set the date as of which subscriptions (or renewals) will no longer be accepted.

Furthermore, for the sake of rigour and honesty, the service should remain available to customers until the final date of validity of the last registered subscription.

If it is impossible to maintain the service until the above-mentioned date, it will be necessary to refund subscriptions in proportion to the duration of unavailable service.

The content of the online EHM was frozen at the end of November 2007 (its software was frozen in June 2006). Having decided to terminate the online EHM service on September 30, 2009, Hachette stopped accepting subscriptions to this service on October 1, 2008, and started proposing subscriptions to the online Larousse Encyclopedia instead of the online EHM. (Note that Larousse belongs to the Hachette Group.)

Factors influencing the life of a product

There are many factors that influence the life of a product. One of them may be the absolute necessity, due to the nature of the product, to **enhance and update its content**, as mentioned above. Most of the other factors impact not only the content of a product but also its software. Such factors are addressed below.

Market and competition

The market and competition must obviously be taken into account in order to ensure that a product remains adapted to market requirements as well as competitive.

Keeping up-to-date on the evolution of the market and being knowledgeable with the **products of competitors** is necessary not only for a product manager but also for a PM. As a PM, you should allocate part of your project budget to purchasing competitors' products or subscribing to them, and you should get to know them in depth by actually using them.

Indeed, you must be able to position the product "you" are creating with respect to its competitors, in terms of content, functionality and performance, in order to draw conclusions regarding the evolution of the product.

Precious information about competition may be obtained from **commercial partners**, with a little help from Marketing & Sales if necessary.

The market often demands **novelty** and even **innovation**.

Marketing & Sales people, in particular those working for distributors and retailers, want clear and simple **sales arguments** to compare a product with its competitors, and they are generally fond of products with **distinctive and "exciting" new features** that can be easily explained to potential buyers in terms of **user benefits**.

For example, here are some innovative (or at least new) features of the EHM that were highlighted as sales arguments and which marked the life of the product:

- *full hypertext (first version of the EHM),*
- *doubling the number of multimedia assets (EHM 2000),*
- *3D rendering of historic monuments and sites (EHM 2000),*
- *natural-language queries (EHM 2000),*
- *summary articles for schoolchildren (EHM 2000, more added in subsequent versions),*
- *"panorama" of search results comparable to the front page of a newspaper (EHM 2005),*
- *compatibility with Windows XP, Mac OS X and Linux (EHM 2005).*

User requirements

User requirements generally evolve as users gain experience with products and therefore become more knowledgeable and more demanding. In that respect, users should be provided with a **channel to communicate** their remarks and requests in the most direct possible fashion. One or several persons need to be assigned to dealing with customer feedback, and they should be required to forward relevant information to the PM so that it may be taken into account for future versions of the product.

As regards Hachette Multimedia ("HM") products, the hotline's phone number appeared on all boxes, in all manuals and on the HM website, where a full contact list (with e-mail addresses) was also provided to let users know whom to contact depending on the type of request. Furthermore, two specific addresses appeared on the EHM website, one for editorial remarks, the other for technical issues. Finally, analyzing searches made by users in the encyclopedia itself gave an indication of their areas of interest, which was one of the sources of information used to set the direction or priorities of the editorial team's work.

Useful remarks and suggestions concerning products may also be made by **commercial partners** (sales reps, distributors, resellers, etc.) and of course **Customer Services**. Such feedback usually reaches the **Marketing & Sales** department, which is another good reason why the PM should entertain a close relationship with Marketing & Sales throughout the life of the product. Furthermore, the PM should not hesitate to go "fishing for information".

Some retailers, in particular large distribution chains, informed Hachette Multimedia of their desire to have an "entry-level" version of the EHM, at a relatively low price, given the profile of the majority of their customers. To meet that requirement, the project team designed, planned and produced what was named the "standard" version of the EHM, downsized to a single CD-ROM with half the number of media and less functionality than the "complete" DVD-ROM version.

Price

The price of a product is generally influenced by market **demand & supply**.

In less than eight years, the retail price of the "bottom-of-the-range" version of the EHM on CD-ROM dropped from 100 euros to 30 euros, mainly due to competition.

A particular iPhone application ("C"), which its developers did not intend to "give away", was in competition with two other applications: one ("B"), which provided almost the same content and functionality as C, was priced at 0.79 euro (with a "light" version free of charge); the other ("A"), which was a superset of C and B, was priced at 15.99 euros.

In order to justify a price for C in the range of 2.99 to 4.99 euros, the developers imagined and planned to develop unique features (and sales arguments) that would make C a better, easier-to-use and more useful product than B and the subset of A.

Price evolution often has a direct impact on a product. As mentioned above, it may be necessary to define a low-price, entry-level product. A high-price version of a product may nevertheless be maintained in the product range by providing more content and functionality than, for example, the previous year's version.

For several years in a row, the range of EHM CD/DVD-ROMs consisted of a "standard" edition on a single CD-ROM at 30 euros, a "complete" edition on two CD-ROMs or a DVD-ROM at 60 euros, a "deluxe" edition on a DVD-ROM at 100 euros, including the Hachette-Oxford English-French Dictionary as a substantial "bonus", and a "network" version, for which the price of the site licence depended on the number of users.

Business model

More generally, the evolution of a product is often tied to the evolution of its business model, ie everything that relates to **sales channels and how revenue is generated**.

For example, the services rendered to users by a website may be subject to a fee or they may be free of charge. Some sites offer a basic service free of charge and a "premium" service requiring payment of a fee. The definition and extent of each set of services may evolve over time: new services may need to be added in order to remain competitive; the payment system may change; advertising space may be increased, etc.

The business model of the online version of the EHM went through many changes, most of which, summarized below, had an impact on the product and therefore required some amount of additional development effort:

- *EHM free of charge, with ads, on Club Internet, Wanadoo, Voila (2000), Yahoo! (2001),*
- *EHM reserved to subscribers on AOL (2001),*

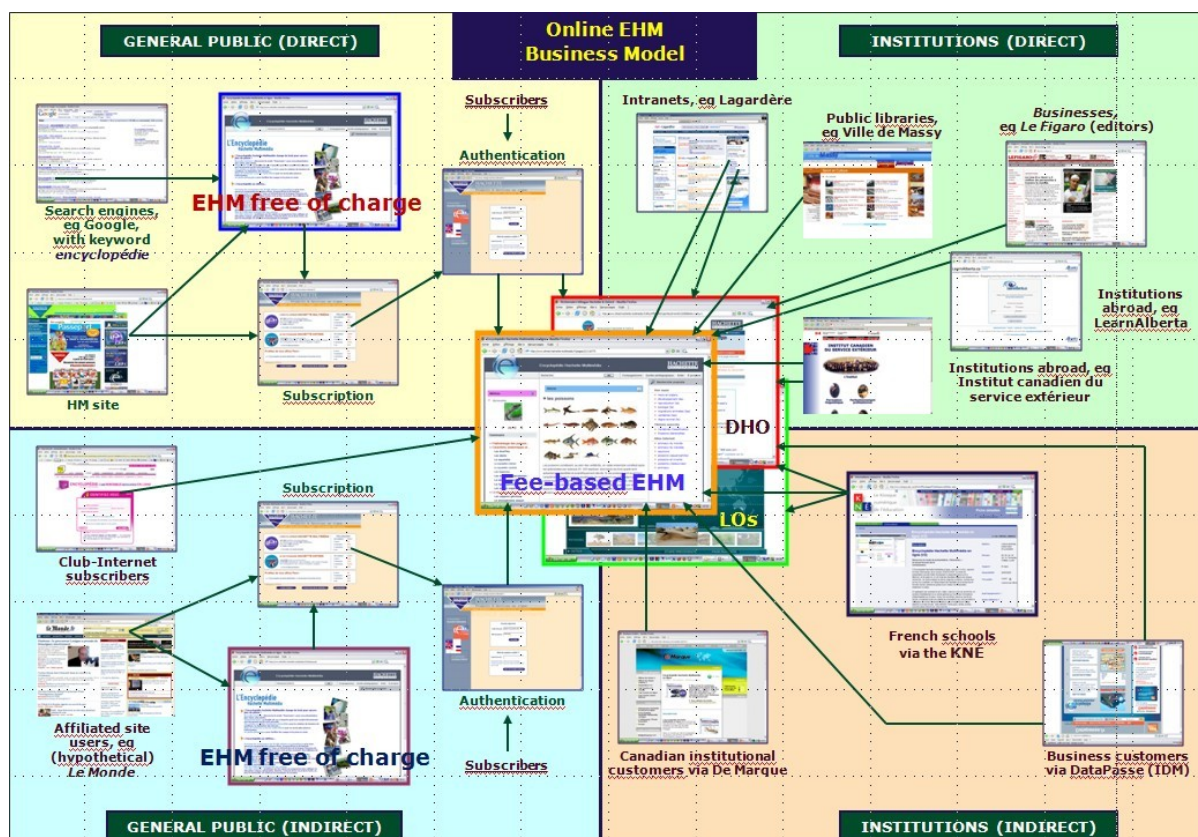
- fee-based EHM "Pro", without ads, for the institutional market (2002),
- switch to fee-based model, with subset of content free of charge, on Wanadoo and Voila (2003),
- fee-based EHM, without ads and with subset of content free of charge, via the Hachette Multimedia website for the general public, and via the "Digital Kiosk for Education" for schools and libraries (2004),
- change of payment system for subscriptions (IDECOD → P-PASS, 2004),
- new fee-based EHM, without ads and with a subset of content and features free of charge, derived from the fully redesigned and redeveloped EHM on DVD-ROM (2005).

As an example, the following diagram represents the business model of the online version of the EHM as it stood in the 2005-2006 period.

The implementation of the model required designing the online encyclopedia software in such a way that a small but consistent part of the encyclopedia's content could be made available free of charge, while the full content was reserved for subscribers.

It also required developing a subscription mechanism and a user authentication system, with a database of user information and administration tools, as well as plugging in a third-party payment system.

Finally, it required a "single sign on" (SSO) interface for user authentication via partner sites through which the online encyclopedia was made available.



If it is feasible, **foreseeable evolutions** of a product's business model should be taken into account during the **product design** phase, in order to make required changes as easy and inexpensive as possible.

Target platforms / Technical environment

A software product is designed to operate on “**target platforms**” consisting of **hardware** devices (computers, tablets, smartphones, e-readers...), **operating systems** (Windows, Mac OS, Linux, Chrome OS, iOS, Android, Windows Mobile...), **browsers** (Internet Explorer, Edge, Firefox, Safari, Chrome, Opera...) and “**plug-ins**” (QuickTime, RealPlayer, FlashPlayer...).

The **good working order** of a product is therefore dependent on its **compatibility** with such platforms, which make up what is also called the product’s “**technical environment**”.

The more **complex** the environment is and the more **dependencies** it creates, the higher is the **risk** of some form of **incompatibility** appearing at some (often unpredictable) stage.

The **choice of target platforms** is generally the result of a compromise. It is obviously desirable to aim at the broadest possible market, but it is also necessary to take into account the product’s development, testing and maintenance costs, which depend on the multiplicity and complexity of the platforms (such costs are not always predictable...).

Unlike its competitors (encyclopedias from Microsoft and Larousse), all versions of the EHM on CD/DVD-ROM were compatible with Windows and Mac OS, and also, as of version 8, with Linux. This wide range of target operating systems enabled Hachette to benefit from the significant Macintosh user base in France, and as far as Linux is concerned, to communicate the fact that the EHM was the only encyclopedia on CD/DVD-ROM available in that more and more “popular” environment (praised by “techies” and institutions in particular). In 2007, the EHM’s compatibility with Linux actually enabled Hachette to win a call for tenders issued by the local administration of the Bouches-du-Rhône (Marseille and region) for a Linux-compatible encyclopedia on DVD-ROM (although the 120,000 portable PCs purchased from HP were eventually configured with Windows!).

The counterpart of choosing multiple target operating systems was significantly higher development and testing costs than those that would have been associated with a single target platform. In the case of the Macintosh environment, substantial software changes were required throughout the life of the EHM, in particular to make it compatible with Mac OS X then with the new Intel Core Duo processors that Apple had chosen as a replacement for PowerPC processors.

Furthermore, writing software for multiple platforms often implies using **development tools** that are not necessarily optimized for all environments. Generally, one **environment** needs to be **favoured** to the detriment of the others, which should be done with full knowledge of the consequences.

A complete redesign and redevelopment of the EHM was undertaken for its third edition (dated “2000”). Because of a relatively low development budget, Java was chosen as the development language because of its multi-platform capability, with a “Java virtual machine” for Windows (developed by Sun Microsystems) and another for Mac OS 9 (developed by Apple). The EHM software thus became extremely dependent on external software. A major incompatibility appeared with Pentium 4 PCs, which was fortunately fixed for the Windows environment thanks to a new virtual machine provided by Sun, but a new release of the EHM had to be produced. In the Macintosh environment, the EHM encountered a series of technical problems, because the virtual machine from Apple turned out to be slower, less stable and more defective than that provided by Sun.

In order to develop a reliable and efficient product, with a satisfactory level of performance, it is often advisable to **focus coding, testing and maintenance efforts on a single platform**, and to **minimize external dependencies**, thus avoiding the risk of higher-than-expected costs and lower-than-expected technical quality.

Choosing Java for the EHM 2000 project was probably a mistake. Furthermore, although it cannot be demonstrated, EHM sales might not have been substantially lower with a single target platform (PC/Windows), but it is certain that production and maintenance costs would have been much lower.

The above-mentioned potential problems are certainly less important and less critical with websites. Indeed, **website compatibility problems** are generally limited to browsers and plug-ins, which are subject to frequent updates that users can easily download and install.

Furthermore, fixing a software bug on a website and updating its content are done much faster and more easily than, for example, producing a new release of a CD/DVD-ROM.

However, a web application may not necessarily work perfectly with all browsers. It should be **optimized and thoroughly tested for a choice of browsers** (not forgetting those provided on smartphones and tablets...), to the detriment of others, and users should be informed of recommended configurations.