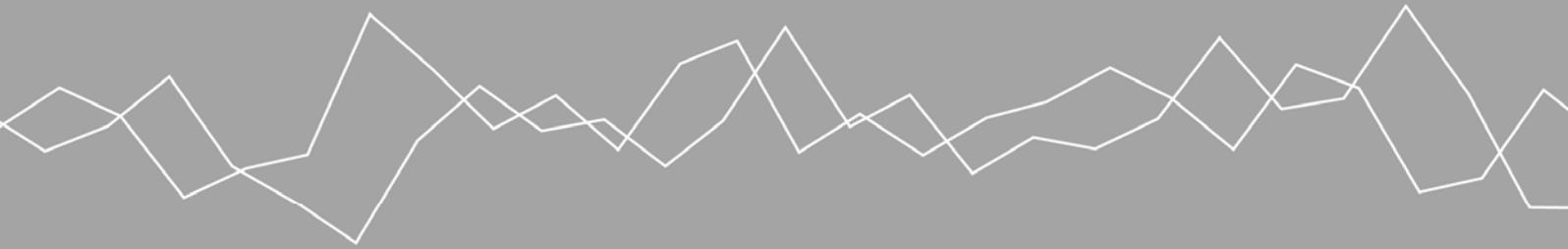


Sources of Benefits



Amsterdam, August 2007
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Sources of Benefits

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Robert Breugelmans
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seo economic research

“The knowledge that it is good.”

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Foreword

Ten large national collection holders have united in a consortium with the aim of digitizing their collections. The Canon of the Netherlands will serve as the guideline. The expectation is that the project, that has been named *Netherlands Heritage: Digital!* will open up countless new and interesting opportunities for education, science, the creative industry and the public at large. However, what are the overall social benefits expected to arise from these applications?

This report describes the outcomes of a study performed by SEO Economic Research during the months that the *Netherlands Heritage: Digital!* project was taking increasingly concrete shape. The study tied in, as much as possible, with the so-called IEO (Infrastructure Effects Overview) method for social cost-benefit analysis (SCBA). Two comments are relevant in this regard. Given that from the national and international perspective this project is highly progressive by its nature and in its ambition, in many instances key figures and estimates had to be used. In addition, the precise scope and content of the project, particularly in terms of the number of objects to be digitized, had not yet been crystallized. Retaining the general ambition level, the consortium can attempt to bring the scope of the project into line with the social value that can be derived from it, although in this regard attention should be paid to the consequences for the calculated revenues. The study at hand can thus be described as a *social benefit analysis* or an *effects analysis* based on key figures. The positive and in some cases also the negative social effects of the project are set out as clearly as possible using the IEO method. The actual direct costs of the project, however, have not been taken into consideration so that no balance of costs and benefits or social rate of return can be presented.

For this study, a great deal of information was requested from the consortium partners, both on their current operations (numbers and origin of visitors, revenues from ticket sales, food and beverages and the museum shop) and on their expectations regarding the effect of the project. We would like to thank all the consortium partners for their cooperation, with particular thanks to the project organization team of Paul Padding, Annemarie Henderson and Theo Camps for their efforts. During the course of the study, Bureau Berenschot conducted a survey in the primary and secondary education sectors aimed at charting the level of interest in and appreciation of the material. This survey played a major role in quantifying the educational benefits.

A team of researchers at SEO Economic Research worked on this project. Joost Poort shouldered the responsibilities of project leader, ably assisted by Robert Breugelmans, Floks Laverman and Bert Hof. A draft of the report was presented for comments to Dr Jan Rouwendal, Senior Lecturer in Spatial Economics at the VU University Amsterdam and a skilled cost-benefits analyst. SEO Economic Research bears sole responsibility for the final text.

Summary

Ten large, national collection holders united in a consortium with the aim of making their collections available digitally as a cohesive whole. The Canon of the Netherlands served as the guideline in this pursuit. The expectation is that the project, that has been named *Netherlands Heritage: Digital!*, will open up countless new and interesting opportunities for education, science, the creative industry and the public at large. Moreover, with this project the Netherlands will be able to position itself at the vanguard in the field of international heritage, which will in turn have a spillover effect on other sectors.

However, what are the overall social benefits expected to arise from these applications? This report describes the outcomes of a study performed by SEO Economic Research during the months that the *Netherlands Heritage: Digital!* Project was taking increasingly concrete shape. The study tied in, as much as possible, with the so-called IEO (Infrastructure Effects Overview) method for social cost-benefit analysis (SCBA). Two comments are relevant in this regard. Given that from the national and international perspective this project is highly progressive by its nature and in its ambition, in many instances key figures and estimates had to be used. Unfortunately, hard national or international experience figures on the expected development of physical and virtual visits were not available. For this reason, the consortium partners made use of estimates. Furthermore, the precise scope and content of the project, particularly in terms of the number of objects to be digitized, had not yet been crystallized. The study at hand can thus be described as a *social benefit analysis* or an *effects analysis* based on key figures. The positive and in some cases also the negative social effects of the project are set out as clearly as possible using the IEO method. The actual direct costs of the project, however, have not been taken into consideration so that no balance of costs and revenues or social rate of return can be represented.

The effects of *Netherlands Heritage: Digital!* are subdivided into direct, indirect and external effects. The overall direct effects are expected to amount to some € 171 million.¹ Direct effects are to be expected, in the first place, on the physical and virtual visits to the consortium partners. Due to the attention value of the digital collection, not only will virtual visits increase significantly but most of the consortium partners also expect to see considerable growth in physical visits. This creates social benefits for the visitors who choose a visit to a museum above an alternate way of spending their leisure time (this also involves an increase in consumer surplus). The consortium partners experience benefits as a result of the profit margin on the additional tickets and the additional expenditures in the museum shop and on food and beverages. Tourists generate a considerable share of these benefits. The total benefits arising from an increase in physical visits are estimated at over € 51 million. The growth in the virtual visits, which are free of charge, does not deliver any revenue to the consortium but rather represents for the visitors some € 6 million in additional consumer surplus.

To determine the levels of interest and willingness to pay in the primary and secondary education sectors, Berenschot conducted a survey among a large number of education institutions. On the

¹ All amounts are presented in euros at 2007 value. Table 5.1 in Chapter 5 provides a systematic overview of the most important items.

basis of this survey, the direct social benefits of educational use were estimated at approximately € 70 million.

Furthermore, direct benefits amounting to some € 25 million are expected for the scientific users of the heritage material. A large proportion of these benefits can be attributed to the shift from physical to virtual visits: instead of travelling to the institute to consult the required sources, researchers can use the internet. This results in savings in travelling costs and time. In addition, making old texts digitally searchable means that new research methods and areas can be developed. This will lead to a rise in the productivity of a number of language and culture researchers.

The use of the material by the creative industry is expected to deliver benefits amounting to almost € 19 million. In part this involves the reciprocal substitution of physical visits with virtual visits and in part new applications, for example, aimed at tourism. A significant proportion of these benefits can go to the consortium in the form of payments for use. Finally, the heritage material can also serve as “raw material” for the development of course material and gifts for naturalization ceremonies and citizenship courses. However, the expectation is that the possible benefits in this regard will be limited.

The indirect benefits of the project are estimated to lie between € 1 million and € 51 million. The lower limit is determined by the balance of the calculated benefits from additional tourism that the project generates and the loss of earnings regarding alternative leisure activities such as other museums, events and the hospitality industry, the popularity of which will fall slightly as a result of the project. The upper limit is set at 30% of the total benefits. External effects such as strengthening cultural-historical awareness and the preservation of heritage are positive but could not be quantified.

The total of all project effects that can be expressed in terms of money, with the exception of the costs of the project itself, come to an amount between € 172 million and € 223 million. The median of this bandwidth is € 197 million. The sensitivity analysis conducted showed that the discount rate used was the most sensitive parameter. When the risk premium is halved (which leads to a real discount rate of 4%) the benefits are some € 57 million higher. Another sensitive parameter is the growth in demand as a result of the project.

In as far as monetary benefits go to the consortium, it would seem natural to deduct these from the subsidy. After all, making money is not the consortium’s primary aim. With regard to the benefits that arrive elsewhere in the economy, the matter is more complex. The benefits of use for the public at large that in the calculations arise from consumer surplus, cannot be used or can only be used to a very limited degree to the benefit of the project. Such benefits that are distributed across society but cannot be collected or can only be collected against high transaction costs, constitute a legitimization of the use of public funds. This also applies, for example, to the indirect benefits that are connected to additional tourism. Benefits for the creative industry can never be entirely pruned away to benefit of the project. Pruning away the benefits in order to reduce the need for subsidy is thus always in conflict with the desire not to frighten off potential users by charging high prices.

Benefits for the education sector could probably be pruned away for the benefit of the project, which would mean that the required subsidy could become significantly lower. However, this should be arranged in such a manner as not to affect demand. A possible alternative model could be to immediately set off the expected benefits against the lump sum funding of the education institutions, while the material would be offered free of charge to schools as well as to educational publishers that could use the material in the production of instructional materials. This would prevent a welfare-lowering drop in demand as well as the creation of welfare losses by doubling the costs (publishers who develop material virtually identical to that offered within the project).

The relationship between the intended project scope in terms of the numbers of objects to be released digitally and the calculated social benefits, is expected to differ greatly between the various effects. As long as the ambition level is retained and the project continues to meet the expectations of the education sector, the calculated educational benefits are virtually independent of the project scope. The same will apply to applications by the creative industry. Benefits that arise from scientific use and virtual visits, however, will fall significantly if the number of digitized objects decreases. The consortium needs to determine which scope for the project would deliver the most favourable ratio of costs to benefits.

1 Introduction

“On the initiative of the Ministry of Education, Culture and Science (OCW), several authoritative national collection holders – including the Rijksmuseum Amsterdam, Naturalis [the National Museum of Natural History] and the National Library of the Netherlands – united in a consortium. The aim is to allow access to the valuable collections as a single, virtual whole. This gives rise to interesting cross links and stories. Using the Canon of the Netherlands as a guideline, a unique and well-structured overview of the heritage of the Netherlands is created, from the earliest inhabitants of the country up until the introduction of the euro.”

Project plan; summary²

The above quote summarizes the ambition of the *Netherlands Heritage: Digital!* project proposal. The large-scale digitization of heritage intended in the project offers numerous new possibilities. Interactive modules and sources can be developed for the primary and secondary education sectors. These can not only play a prominent role in the teaching of history but also in other subjects such as geography, biology, social studies and culture / art appreciation. Researchers too are expected to profit from the project: large amounts of old source material will gain low-threshold accessibility and become digitally searchable in this project. Research methods that preciously cost a great deal of time can be applied to digitized material and will without doubt lead to new discoveries and links.

In addition to educational and scientific visitors, current and future visitors from the affiliated institutions – both physical and virtual visitors – will be able to profit from an enhanced and interactive collection in which cross-links can be made. Given the progressive miniaturization of electronics, future possibilities seem boundless: in 2012, a tourist standing in front of an historic building in Amsterdam could be able to call up paintings of the building on his/her mobile telephone or PDA and receive information about former residents of historical interest and other cross-links.

However, a large-scale project such as this one involves considerable costs: costs related to the digitization of the material, creating the metadata needed to make cross-links, setting up the information architecture management system, and the creation of services. Considering that all the consortium partners are publically funded institutions, the many and varied application possibilities the project creates should be weighed up against the necessary investment.

A social cost-benefit analysis (SCBA) is a customary instrument for supporting such complex considerations. In such an SCBA, the effects of a project on the various parties within the Netherlands will be charted as accurately as possible and compared with the scenario of the project not being implemented. Wherever possible, the expected scope of these effects is expressed in both figures and money. A framework of this kind is intended to deliver optimum

² The descriptions and features of this project are largely based on Version 0.8 of the project plan *De digitale canon: Nederlands Erfgoed Digitaal* [The Digital Canon: Netherlands Heritage Digital] dating from June 2007. The formulations and references in subsequent versions of the project plan may deviate slightly from the source used. The objectives regarding the amounts of material to be digitized may be adjusted. Paragraph 5.3 discusses the implications this will have.

insight into the social effects of the project, how these effects are distributed across the various parties and which (positive and negative) effects are not expressed in terms of money.

The *Netherlands Heritage: Digital!* Consortium requested SEO Economic Research to carry out a social cost-benefit analysis into the project referred to above. It gradually became clear that the precise scope and content of the project, particularly in terms of the number of objects to be made digitally accessible, was still in motion. Retaining the general ambition level, the consortium can attempt to bring the scope of the project into line with the social value that can be derived from it, although in this regard attention should be paid to the consequences for the calculated benefits. The study at hand can thus be described as a *social benefit analysis* or an *effects analysis* based on key figures. The positive and in some cases also the negative social effects of the project are set out as clearly as possible using the IEO method. The actual direct costs of the project, however, have not been taken into consideration so that no balance of costs and benefits or social rate of return can be presented.

Chapter 2 of the report briefly explains what a social cost-benefit analysis is and outlines the IEO method. The subsequent chapters contain the phases needed for a SCBA. Chapter 3 describes the *Netherlands Heritage: Digital!* project and outlines what would happen without such a project (the so-called “null alternative hypothesis”). Chapter 4 then sets out how the expected project effects are distributed and estimated and how a value in terms of social benefits is linked to these effects. The assumptions made to translate the effects into figures and the bases of these assumptions are constantly indicated as explicitly as possible. Chapter 5 summarizes the social effects in a cohesive framework and sets out how these effects are distributed between the various stakeholders (actors). In addition, this chapter also describes the sensitivity of the outcomes for the main parameters.

2 Structure of the cost-benefit analysis

2.1 What is a SCBA?

A social cost-benefit analysis (SCBA) is a systematic and cohesive survey of all the effects caused by a project. It comprises all the social effects, not just the “financial” ones. Insofar as possible, this report uses the IEO method in common use in the Netherlands. This method has been developed since 1998, commissioned by the Ministry of Transport, Public Works and Water Management and the Ministry of Economic Affairs. A large number of market research firms and other experts were involved in the development of this IEO method that was intended to arrive at a canonical approach to the social valuation of large infrastructure projects in order to improve the quality of the debate and decision-making regarding such projects.³

The use of the terms “cost” and “benefits” has to do with the aim of, insofar as possible, attaching a price to the effects, in other words, to express them in euros wherever possible. Expressing effects in euros furthers comparability with the costs of the project, with other effects and with other projects. In this respect, the price should be a reflection of the value society attaches to these effects. The costs and the effects expressed in euros (positive and negative) determine the balance of social costs and benefits of the project. On this basis, a statement can be made about the net welfare effects of a project.

A key figures cost-benefit analysis (KCBA) is a SCBA that is (largely) based on key figures rather than on detailed estimates of all costs and benefits. Every cost-benefit analysis uses key figures to a certain degree, but a KCBA is more inventory-like in nature than a SCBA, and is focused on the order of magnitude of the effects and the balance. A handicap of the analysis of the digitization of heritage collections at hand is that it covers relatively unexplored territory: as was already mentioned, the IEO method was primarily developed for infrastructure projects. Although the system behind the method is based on universal economic insights, its practical application in past years was mainly focused on infrastructure and spatial planning projects; it is in these policy areas that most practical experience with the method has been gained. This does not detract from the fact that the method is being increasingly applied in other domains, ranging from the costs and benefits of labour participation policy and combating crime to community schools. What is more relevant for *Netherlands Heritage: Digital!*, is that in 2006 SEO Economic Research used the method in the *Beelden voor de Toekomst* [Images for the Future] preservation and digitization project.⁴ In addition, SEO Economic Research conducted a literature study together with the *Atlas voor Gemeenten* Foundation to provide the basic principle for a CBA framework for investments in art and culture.⁵

³ The core of the method was originally set down in the so-called IEO guidelines: Eigenraam, Koopmans, et al., 2000: *Evaluatie van infrastructuurprojecten; leidraad voor kosten-batenanalyse, Deel I: Hoofdrapport & Deel II: Capita Selecta*. At the same time, a number of underlying background studies were published, followed by several supplements to the guidelines in 2003.

⁴ Hof, Korteweg and Poort, 2006: *Baten in Beeld: Uitwerking 'Kengetallen kosten-batenanalyse Beelden voor de toekomst'*.

⁵ This was commissioned by the Ministry of OC&W: Marlet (*Atlas voor Gemeenten* Foundation), Poort & Laverman, 2007: *De kunst van investeren in cultuur*.

Given the lack of hard data on many points and the relative lack of experience with such projects elsewhere, this study has the character of a key figure SCBA.⁶ Not all the effects of the project can be expressed in terms of money, and for many of the effects we had to use assumptions and estimates that, for lack of empirical data, had to be largely based on common sense and expert opinions. This does not detract from the fact that such an analysis can provide good insight into the expected scope of the social effects of the project.

2.2 Project and null alternative hypothesis; variants and scenarios

In an SCBA, the situation with project implementation is set against the situation without project implementation: the null alternative hypothesis. The structure of this null alternative hypothesis is important for the extent of costs and benefits. The null alternative hypothesis should describe as realistically as possible what would happen if the project were not implemented. In this way, the costs and benefits of a project can be determined in a pure manner.

Sometimes, a project can be implemented in different variants that differ from one another in terms of costs and benefits. In that case, these variants are set against each other in the null alternative hypothesis. It is advisable to determine multiple variants for KCBA's in particular due to their inventory-like nature. The effects of a project can be influenced by future developments that are not part of the project itself. In that case, there is a possibility to take different scenarios as a starting point to examine what each scenario would mean for the outcomes of a project.

2.3 Sensitivity analyses

As far as possible, an SCBA should set out any risks (for example, from dependency on developments outside the project) and uncertainties (about the costs or about the estimated effects). This can entail working with different scenarios and variants. In addition, an SCBA is not complete without an analysis of the sensitivity of the outcomes to the assumptions made and the discount rate observed.

2.4 Types of effects

In an SCBA, the effects are usually broken down into direct, indirect and external effects. The observed definitions are based on (a supplement to) the IEO guidelines.⁷ *Direct project effects* are the costs and benefits for the owner, operator and purchasers of the goods and services involved in the project. *Indirect economic effects* are the costs and benefits that are passed on via market transactions to the producers and consumers outside the market with which the project is involved. If this increases the benefits, we have what are known as additional indirect benefits. Otherwise, what is involved is the pure passing on of benefits that should not be again added to the direct effects. They could, however, be of importance to the distribution of the effects.

⁶ As already indicated, the direct project costs were not taken into consideration in this so that at this stage no net welfare effect can be determined for the project.

⁷ Cf. for example, Elhorst, J.P., A. Heyma, C. Koopmans and J. Oosterhaven (2004), *Indirecte Effecten Infrastructuurprojecten: Aanvulling leidraad IEO*, RUG/SEO, Groningen/Amsterdam.

External effects are costs and benefits that arise outside any market with parties other than the owner, operator or purchasers of the project goods and services. An SCBA is usually conducted from a national perspective: it is concerned with the costs and benefits for those living in the Netherlands.

2.5 Actor analysis: distribution of effects

An SCBA calculates the costs and benefits of projects for society as a whole. In this regard, the distribution of effects across the various parties can also be examined. Who bears the costs? And who ultimately benefits? Insight into these distribution aspects can also assist in clarifying the difference between passed-on effects and generated effects, which is important to avoid double counting. The actors in the cost-benefit analysis at hand are, for example, the consortium partners and purchasers such as (virtual or physical) visiting consumers, the education sector and companies in the creative industry. Wherever possible, an estimate of who could ultimately receive the benefits constitutes part of the cost-benefit analysis.

2.6 Starting points

Apart from the project definition, the null alternative hypothesis, the costs and effects of the project and the valuations of the effects, the building blocks of a calculation of the social costs and benefits are the *period* for which the costs and benefits are calculated and the *discount rate* that is applied to give future costs and benefits a monetary value (and thus make them comparable).

According to the IEO guidelines, the period for which the costs and benefits are calculated may be set as the lifespan of the project, or up until the time at which the null and project alternative hypotheses fall together (however, account needs to be taken of risks, including via the discount rate). Insofar as digitization without the project (with government support) does not take place at all, the lifespan of *Netherlands Heritage: Digital!* is, in principle, infinite. Taking the fast pace of technological development as a starting point, however, it would be illogical to assume that digitization that is done now, would remain ‘state of the art’ forever. Standards and file formats are changing rapidly but can be kept up to date through conversion. Yet it is quite conceivable that more radical technological developments take place, as a result of which the resolution, for example, or other aspects of the digitization will no longer be satisfactory at some time in the future, while the original objects retain their authenticity. Therefore, this study assumes a time horizon of fifty years. Given that the effect of the discount rate increases rapidly in later years, the difference between a fifty years horizon and an infinite time horizon with the discount rate used is less than 10%.⁸

All the costs and benefits are expressed in euros and given a monetary value from 2007, the year preceding the initial investment. Regarding the discount rate, we apply a (real) discount rate of 5.5%: the risk-free rate of 2.5% according to the most recent updating plus a general risk

⁸ In 50 years, the present value of an annually recurring amount (x) with a rate of discount of 5.5% would be 16.9 times x . In 100 years it would be 18.1 times x ; in 300 years 18.2 times x . Extending the period from 50 years to 300 years would thus mean an increase of approximately 8% of the present value of a recurring amount.

premium of 3%.⁹ This is the standard procedure that should be used in cost-benefit analyses based on the IEO system.¹⁰ If possible, when making the present value calculations, a project-specific risk premium should be observed. It would seem logical to use different premiums for different risk profiles of the costs and benefits.¹¹ This could, for example, mean that the educational benefits are discounted with a relatively low risk premium, while the benefits from tourism are discounted with a relatively high risk premium. Determining the levels of such specific premiums is, however, anything but easy. For this reason, in this study we first used a discount rate of 5.5 % and subsequently investigated how the outcomes change if a lower risk premium of 1.5% is applied (discount rate of 4%).¹²

⁹ Letter of the Minister of Finance dated 8 March 2007 to the chair of the Dutch Lower House, reference IRF 2007-0090 M. From the introduction of the IEO guidelines up until the beginning of 2007, the real rate of discount amounted to 4%. Eigenraam, Koopmans, et al., 2000: *Evaluatie van infrastructuurprojecten; leidraad voor kosten-batenanalyse*, p. 62 ff.

¹⁰ Ministry of Transport, Public Works and Water Management; Ministry of Finance; CPB [Netherlands Bureau for Economic Policy Analysis]; RebelGroup: *Risicomaardering. Aanvulling op de Leidraad OEI*, December 2004 (p. 34).

¹¹ Ministry of Transport, Public Works and Water Management; Ministry of Finance; CPB [Netherlands Bureau for Economic Policy Analysis]; RebelGroup: *Risicomaardering. Aanvulling op de Leidraad OEI*, December 2004 (pp.18 and 30).

¹² The reason for looking exclusively at the effect of a low risk premium is that it appears that benefits in the education sector constitute a considerable proportion of the social benefits. Compared to other sectors, the effect of macroeconomic risks on educational benefits is much lower.

3 Netherlands Heritage: Digital!

This chapter describes the *Netherlands Heritage: Digital!* project. Based mainly on the project plan¹³, details are given of the composition of the consortium, the definition of the project (what is going to happen) and the null alternative hypothesis (what would happen if the project were not implemented?). Although an economic analysis of the expected *effects* of the project is part of the following chapter, this chapter does look at the user groups and applications that are set out in the project plan. After all, the applications and users that the consortium has in mind constitute the basis of the cost-benefit analysis.

3.1 Consortium and project definition

The following ten parties make up the consortium behind *Netherlands Heritage: Digital!*:

- Rijksmuseum Amsterdam
- Openluchtmuseum [Open-air Museum]
- Koninklijke Bibliotheek [National Library of the Netherlands]
- Instituut voor Beeld en Geluid [Netherlands Institute for Sound and Vision]
- Letterkundig Museum [Literature Museum]
- Naturalis [National Museum of Natural History]
- Nederlands Fotomuseum [National Photography Museum]
- Nederlands Architectuurinstituut [Netherlands Architecture Institute]
- Rijksmuseum voor Oudheden [National Museum of Antiquities]
- Nationaal Archief [National Archive]

The above collection holders aim to allow access to a major part of their collections as a virtual whole using the Canon of the Netherlands as the guideline. In this way, new (virtual) cohesion will be created between the objects in the various collections. Moreover, the consortium partners are seeking contact with several dozens of other collection holders, in particular the administrators of regional and local archives. Bearing in mind the aim of flexibility and thus being future-proof, the choice was made not to include distribution partners and services developers in the consortium.

To create a picture of the scope and ambition level of the project, Box 3.1 contains a summary of the collections that are to be digitized in accordance with the observed project plan. A demand-driven approach will be an important point of departure in this regard. During the selection of material, the aim will be to achieve a clear relationship with the Canon; depicting important icons of particular eras/events/stories; selection of irreplaceable and essential material (top pieces); material that is suitable for the transfer of information and is visually attractive; capacity for use in education, research, cultural history, cultural tourism and in the creative industry. A further objective is to digitize vulnerable material that due to its fragile nature is stored behind locked doors.¹⁴

¹³ *The Digital Canon: Netherlands Heritage Digital*, project plan, Version 0.8, June 2007

¹⁴ Project plan, p. 22. It will have to be proven in practice whether or not these criteria offer sufficient support for actual selection, and whether or not the entire collections of all institutions fall within these criteria.

Box 3.1 Products and activities within *Netherlands Heritage: Digital!*

Netherlands Heritage: Digital! intends to allow access to the following amounts of material as a cohesive whole:

- Rijksmuseum Amsterdam: over 750 thousand paintings, etchings, coins, maps, pieces of furniture, etc.
- Openluchtmuseum [Open-air Museum]: 50 thousand objects from everyday life
- Koninklijke Bibliotheek [National Library of the Netherlands]: the magazine collection
- Instituut voor Beeld en Geluid [Netherlands Institute for Sound and Vision]: over 50 thousand hours of audio-visual material
- Letterkundig Museum [Literature Museum]: the complete works of 50 leading authors
- Naturalis [National Museum of Natural History]: 700 thousand objects in the field of natural history
- Nederlands Fotomuseum [National Photography Museum]: 1.5 million photos and negatives
- Nederlands Architectuurinstituut [Netherlands Architecture Institute]: 225 thousand drawings, 2.4 million documents; 14 thousand photos; 300 models
- Rijksmuseum voor Oudheden [National Museum of Antiquities]: *unknown*
- Nationaal Archief [National Archive]: *unknown*

In the first place, the activities within the project consist of conserving, digitizing and describing the content of this material in such a way that connections and cross-links can be made. It should be noted in this regard that not all the objects within the project need to be digitized. In particular the Institute for Sound and Vision was allocated a budget in 2006, through the *Beelden voor de Toekomst* project, to conserve and digitize the material mentioned above. Needless to say, the other consortium partners are not starting from scratch either regarding the digitization of their collections. The numbers stated, however, give an indication of the size of the end product. Apart from digitization and contextualization, the project will also focus on developing user entry points, added-value services and a management system.

Source: Based on *The Digital Canon: Netherlands Heritage Digital*, project plan, Version 0.8, June 2007

3.1.1 Planning of the project

In the project plan, it is assumed that the project, after a preparatory phase in 2007, will be implemented in 2008. In 2008, the selection, conservation and digitization of the material will commence simultaneously, as will the contextualization and the provision of metadata. Furthermore, in 2008 a start will be made on developing the information architecture and the services, with the objective of delivering the first products and services within one year.¹⁵ According to the schedule, the conservation and digitization of the material will be completed in 2011. The contextualization will be finished in 2013 and the project will then come to an end.

3.2 Target groups and project effects

The project plan distinguishes four primary target groups:

- the education sector;
- science and research;
- the creative industry;
- the public at large.

To serve these target groups, a combination of two business models is envisaged: an open environment with basic services available to everyone, alongside a payment environment with target-group specific added-value services. Depending on the nature of the target group, the material will be offered free of charge, against the cost price, or at a market price. Details on the target groups and the intended applications per target group are provided below.

¹⁵ Project plan, Chapter VI.

3.2.1 Education sector

The internet and other digital teaching resources and reference works (e-learning, distance learning) are occupying an increasingly important position in the education sector. And yet the Netherlands Organization for Applied Scientific Research (TNO) stated in May 2005 that “the market for web-based [educational] content is virtually undeveloped because commercial providers are cautious with their investments and schools (in their role as content developers) are not capable of creating the volume of demand. The sector is, however, convinced of the added value that web-based educational content has for education.”¹⁶

The *Netherlands Heritage: Digital!* project ties in well with this tension observed. In addition, two recent political developments are in good alignment with the project proposal. The first concerns the announcement by the Minister of OCW prompted by the presentation of the final version of the *Canon of the Netherlands* on 3 July 2007, to make the Canon obligatory in primary and secondary education. In a letter to the Lower House, the Minister stated: “We would therefore like to follow the recommendation of the committee and include the Canon in the attainment targets of the upper years of primary education and the lower years of secondary education. The Canon is, after all, primarily intended for students aged eight to fourteen years old [...] Schools and teachers are responsible for the way in which they do this.”¹⁷ The Canon could already be included in the attainment targets in the 2008-09 school year. To facilitate the introduction of the Canon into the education sector, the idea arose that “organizations such as the *Instituut voor Geschiedenisdidactiek* [Netherlands Institute for Teaching and Learning History] and the *Vereniging van docenten Geschiedenis en Staatsinrichting in Nederland* [Netherlands Association of Teachers of History and Political Science] could themselves develop a “canon course” with the financial support of the Ministry of OCW and in concert with the teacher-training programmes. This could best be done in consultation with the “Canon foundation [...] to guarantee good alignment with the Canon”¹⁸. This Canon foundation had been allocated a subsidy of € 200 thousand for five years “to guarantee the continuation of the website [entoen.nu] and to expand it together with teachers”. Cooperation in and making use of this project thus seem to be obvious. For the practice of teaching using the Canon, this cooperation also seems logical.

The second promising development involving educational use concerns “free school books”. Page 18 of the *Coalition Agreement between the Lower House parliamentary parties of the CDA, PvdA and ChristenUnie* states: “Schoolbooks in the secondary education sector will become free. Financing will take place through block-grant funding.” This intention entails an estimated annual amount of 250-300 million euros.¹⁹ This policy intention also creates possibilities for the application of the digital material that is offered in this project. It goes without saying that the material will be used in Canon teaching, but also in subjects such as culture and art appreciation (CKV), biology, geography and languages. The material can play both a supplementary role and replace (parts of) the instruction materials that are currently being used. The consortium is considering developing new instruction materials in cooperation with schools and publishers.

Finally, the threatening shortage of teachers (as a result of the ageing of teaching staff and relatively little intake into teacher-training programmes) supports the importance of projects such

¹⁶ Pennings, L., M. van Staden (et al.) (2005). *Van bloei naar groei*, p. 4.

¹⁷ Lower House, 2006-2007, 30 800 VIII, no. 162. Letter of the Minister of Education, Culture and Science.

¹⁸ Ibidem.

¹⁹ For financial reasons the cabinet intends to introduce the free school books in phases: in 2008-2009 for the first stage of secondary school and in 2009-2010 throughout the whole of secondary education. However, the Lower House parliamentary groups of the coalition parties are set on a complete introduction in 2008-2009.

as *Netherlands Heritage: Digital!*. In the long term, such projects can help to lower the labour-intensity of teaching through increasing the amount of independent work done by students.

For the time being, the project plan does not specify whether or not this material for educational use will be made available free of charge, against the cost price or at a market price.

3.2.2 Science and research

The science sector will be able to profit from *Netherlands Heritage: Digital!* via a multi-language, very extensive heritage database, in which the collections of the various institutions will be searchable from a single point, complete with a wealth of metadata. Moreover, in the course of the project a great deal of historical material will be made searchable. Given the large amounts of material that will be digitized within the project, the database will not exclusively comprise top pieces that have been scientifically “exhausted”, but rather also objects that as yet have not been intensively investigated. This opens up new possibilities for linguistic and other types of scientific research. The consortium intends to serve this user group on the basis of cost price.

3.2.3 Creative industry

The creative industry is a patchwork of large and small companies in different sectors. Generally, these are companies that are active in the visual and performing arts, festivals, events and exhibitions, film, media, literary writing, journalism, design (including fashion and computer games), architecture, advertising and graphic design (Marlet & Poort, 2005; p. 9). In recent years, the creative industry has attracted great interest from policymakers, among other reasons because this sector has undergone above-average growth in recent years, and because a creative labour potential turns out to be a good predictor of regional economic growth (Marlet & Van Woerkens, 2004).

It seems plausible that a number of these branches of business would have great interest in the material that will be made accessible in the project. Even now, companies in the creative industry know how to find their way to institutions such as the Netherlands Architecture Institute and the Photography Museum. Written and audio-visual media can use the material for writing articles and making documentaries, or probably in the development of theme channels. The architecture and design sectors are also expected to be interested in specific material. The educational publishers, that have already been mentioned under the heading “Education sector”, are equally obvious interested parties. Publishers in the travel domain could use the material to develop new services such as (GPS-guided) travel guides and historic walks.

The letter of the Minister of OCW following the final version of the Canon²⁰ also offers points of reference for use by the creative industry. For instance, the letter points to initiatives taken by *Klokbuis* and *Teleac/Teleblik* (children’s and educational television programmes), which have made video clips and programmes related to the Canon. The development of theme channels and the multi-media project *Het verleden van Nederland* [The Netherlands’ Past] are also mentioned in this regard. According to the Minister, the Canon could play a role in citizenship courses and naturalization: “The Minister for Residence, Neighbourhoods and Integration [...] will consult with the parties involved about how this can best be implemented in practice.” This role could be actively taken up by multi-media companies in the creative sector.

²⁰ Lower House, 2006-2007, 30 800 VIII, no. 162 Letter of the Minister of Education, Culture and Science.

The consortium intends to charge all these creative industry users a market price for their use of the material. This could lead to a revenue maximizing effect.

3.2.4 Public at large

Everyone with an interest in Dutch heritage falls under the public at large. According to the consortium this involves “people who are interested in cultural-historical walks, nature-lovers, members of Antiquities Chambers, and ordinary museum visitors as well as Dutch and foreign tourists.”

For these groups, the project will expand the visibility and findability of the physical heritage collections and moreover will place the collections in each other’s contexts. The material will be offered in Dutch and English and the collections of all the affiliated institutions will be searchable from a single point. This will expand the public reach of the collections. Thus, several institutions within the consortium expect that not only cultural participation but also actual visits to museums will increase: “The internet will act as an entrance and source of inspiration which will be used by many to find their way to museums.”²¹

According to the project plan, access to the basic collection will be free of charge for the public at large, while market prices will be charged for added-value services.

3.2.5 Other effects

In addition to the above effects for the education sector, science, the creative industry and the public at large, the project plan mentions several more general aspects and consequences of the project. These are largely connected with the innovative nature of the project. Due to the large scale of the project and the ambition of several institutions to make the databases simultaneously searchable, according to the consortium, the information architecture to be developed will be cutting edge on an international level: the Netherlands will thus be at the vanguard of the heritage and culture world. In turn, this could have beneficial effects on libraries and other sectors that could also profit from the knowledge and experiences gained in the project and the economies of scale attendant on the development of the information architecture and standards.

3.3 Null hypothesis

According to the IEO guidelines, project effects are defined as the difference between a development with project implementation (project alternative hypothesis) and without project implementation (null hypothesis). The construction of the null hypothesis is thus a decisive component of a CBA. In the case of the *Netherlands Heritage: Digital!* project, the null hypothesis will be that no (new) financial impetus will be given to the digitization activities of the consortium partners. The tax burden or public debt could then be lowered by an amount equal to that of the net present value of the project budget. The social costs (the “disrupting” effect) of collecting the necessary taxes would then be removed as well.

The pace at which the consortium partners are currently digitizing their collections differs from one to the other. The Institute for Sound and Vision in particular, is working hard at the moment on conserving and digitizing its collection thanks to the subsidy allocated via the *Beelden voor de Toekomst* project. The National Archive is also a member of that consortium. In the future, public

²¹ Project plan, Version 0.8, p. 13.

visibility may well decrease, particularly among the institutions that currently only have limited financial possibilities for digitizing their collections. The fact is that people increasingly glean their information from the internet and use the internet to plan tourist, cultural and educational outings. In the long term, this could lead to falling or stagnating numbers of visitors, when competing museums and institutions in the Netherlands and abroad do digitize their collections. Thus, in the null hypothesis, (the growth in) annual cultural tourism to the Netherlands could fall when the museum and heritage sectors in neighbouring countries develop a better digital fascia. Therefore, in the null hypothesis scenario, the growth in tourist spending could also fall.

For students and staff at research universities and universities of applied sciences, the internet is playing an ever growing role as an information source. Limited (lagging behind) accessibility via the internet to information or archive institutions like the National Archive, Literature Museum, the National Library of the Netherlands, the Netherlands Architecture Institute and the Netherlands Photography Museum, could cause their role as information sources to collapse in the course of time. Whether or not this will happen and if so at what pace, is expected to depend, among other things, on the pace at which alternative sources and archives in the Netherlands and abroad digitize their collections.

Finally, digitized access to the collections in the culture and heritage sector is expected to take place in a more fragmented manner in the null hypothesis. Each institution will tend to make its own plan according to its budget, which will only hinder the linking of archives in the future. On the other hand, even without the project, heritage institutions could of course work together from their own budgets, if this would enable them to achieve returns to scale or prevent fragmentation.

3.4 Summary

The *Netherlands Heritage: Digital!* project is a large-scale effort by ten national collection holders to allow digital access to their collections and to make them searchable as a whole. The most important target groups that are expected to profit from this project are the (primary and secondary) education sectors, science, the creative industry and the public at large. In addition, through this project, the Netherlands could take over a position at the vanguard of international heritage sector which could in turn have spillover effects for other sectors.

In the null hypothesis, the tax burden or public debt would be lowered by an amount equal to the net present value of the project costs. On the other hand, the pace of digitization among the collection holders would be much lower than if the project were to be implemented. This would damage the visibility of the institutions in the future which could lead to their role as information sources tailing off and also to falling numbers of visitors. In addition, the digitization activities of the consortium partners in the null hypothesis would take place in a more fragmented manner so that returns to scale would not be utilized and the future integration of the digitized collections would probably be more difficult.

4 Effects of the project

4.1 Introduction: actors

The calculation and valuation of the project effects in this study are in close alignment with the target groups set down in the previous chapter: the education sectors, science, the creative industry and the public at large. These groups can again be found categorized into social actors. In addition, these actors include the consortium, the government, the rest of Dutch society and foreign tourists. Obviously, the consortium plays a central role: in the first place, it is the intended recipient of the project subsidy and the director of the project (much of the actual work will be sub-contracted to third parties); in the second place, the consortium will experience many of the project effects. The primary role of the government is to provide the necessary funds. The rest of Dutch society enters the picture when there are costs and benefits for parties that are not users of the digitized material. Finally, foreign tourists play a role that deviates from that of the public at large due to the national framework of the CBA: cost and benefits for the tourists themselves are therefore not counted. The effect of tourism on domestic actors, however, can be of importance.

This chapter discusses the various effects included and monetarized in this analysis. We have indicated as accurately as possible how each effect is quantified, what assumptions were made in this regard and how the effects are distributed across the various actors. As is customary in a CBA, the effects are classified according to the categories of direct effects, indirect effects and external effects. In line with the intention in the project proposal of commencing the development of services in 2008, it is assumed (unless stated otherwise) that the effects will build up in a linear manner from 2009, attaining their full scope by 2015, two years after the completion of the project.

4.2 Direct effects

4.2.1 Physical visitors

Digitizing the collections of heritage institutions can have two opposing effects on the numbers of physical visitors. On the one hand, the digital collection offered to visitors constitutes an alternative to a physical visit: people can visit the site or database instead of the institution itself. In that case, they save the money a physical visit would cost, which can be recorded as a welfare gain. On the other hand, the digitization of collections could encourage physical visits because people become aware of what is offered and can realize their latent demand.

We cannot know in advance which of these two effects will be stronger. The expectation is that the effect will depend on the motivations of the physical visitor. Few tourists will decide that seeing an image of the Night Watch on the internet would obviate a visit to the Rijksmuseum. And yet users who travel to the National Archive or the Netherlands Architecture Institute (NAi) to search for specific information may well prefer to do so from their PC at home or at the office. This plausible reasoning is supported by a study conducted among users of digital heritage material by the Netherlands Institute for Social Research/SCP. The respondents indicated that they experience a visit to a museum as an outing, an experience that cannot be replaced by a

virtual visit on the internet. Conversely, digital access to an archive can make a physical visit unnecessary.²² Given that, to our knowledge, no empirical data is available on the effect of digitization on visitor numbers – this is due to the innovative nature of the project – each of the consortium partners was asked what its expectations were regarding the development of physical visits as a result of the project. Box 4.1 summarizes the assumptions that were made on the basis of these expectations.

Box 4.1 Assumptions pertaining to the trend in physical visits to the consortium partners

The trend in the numbers of physical visitors was calculated based on the information provided by the consortium partners. Where information was lacking, assumptions were used. Below is an overview of the information and assumptions from which the growth figures for physical visits were derived:

- All current visitor figures were provided by the institutions.
- Creative/commercial use (based on the figures of the consortium partners) has been deducted from the current visitor figures (we return to this in paragraph 4.2.5).
- The institutions provided the percentages for Dutch visitors, with the exception of the National Library of the Netherlands, the National Archive and the National Museum of Antiquities. For the National Library of the Netherlands and the National Archive, we have assumed that the percentage of Dutch visitors corresponds to that of the Literature Museum. For the National Museum of Antiquities, we have used the same percentage of Dutch visitors as for the Open-air Museum.
- With the exception of the National Library of the Netherlands, figures were provided regarding the duration of visits to the museums. For the National Library of the Netherlands, we have averaged the duration of visits to the Literature Museum and the National Archive.
- Wherever possible, the combination of entrance payments and revenues from the museum pass subsidies was divided by the number of visitors in calculating the admission prices. The revenues from the museum pass were based on rough estimates derived from the information provided by the *Stichting Museumkaart* [Museum Pass Foundation]. This calculation only resulted in acceptable amounts for the Literature Museum and the National Museum of Antiquities. Based on these amounts, it was determined that on average each visitor pays approximately 52% of the adult rate for admission to a museum.
- The National Museum of Antiquities was the only institution to provide information about the travelling time of visitors, namely 72 minutes (= 1.2 hours) for a one-way trip. Based on this, the travelling *distance* for a one-way trip was assumed to be 100 km. This one-way travelling time seemed to be a reasonable starting point for all the institutions (given their national significance) and was assumed to be the same for all the consortium partners. However, visitors will often combine a visit to an institution with a visit to family, friends or other cultural or recreational facilities in the area. Therefore, the average duration of the visits to an institution was used as a key in the degree to which travelling time and travelling expenses can be related directly to the visit. For an average visit of 4 hours or more, it was assumed that the return journey can be completely ascribed to the visit to the consortium partner (as a measure of valuation). For a visit of less than 4 hours, the total costs of the return journey are attributed proportionately.
- For the scientific institutions (National Library of the Netherlands and the National Archive) it was assumed that there would be no net increase in physical visits. The assumption was that for these institutions the increase in physical visits as a result of the attention value of the digital collection would be equivalent to the drop related to the possibility of accessing information digitally from home or at work.
- The Rijksmuseum forecast growth of 10% from year 1 up to and including year 5, which translates into 50% in total. The Literature Museum expects a total growth of 15%. Naturalis and the National Museum of Antiquities expect no growth in physical visits. The Open-air Museum forecast growth of 2.5% on top of the usual growth and it assumed that this additional growth would continue for 10 years. It was assumed for all the other institutions that the same forecast applied as for the Open-air Museum.
- The increase in physical visits was multiplied by the percentage of Dutch visitors and thus divided into Dutch and foreign visitors.

²² Netherlands Institute for Social Research/SCP (October 2006). *Klik naar het verleden: Een onderzoek naar gebruikers van digitaal erfgoed: hun profielen en zoekstrategieën*, pp. 57-58.

Insofar as an increase in physical visits is expected, this would deliver net social benefits. After all, the additional visitors opt for a physical visit rather than spending their time and money in other ways. The visit delivers an additional user benefit to them for which there is, however, a price. The costs connected to the journey (time and expenses), the visit (admission costs and time spent) and possible expenditures in the museum shop and on food and beverages were used as the basis for calculating the total costs connected to physical visits. For the valuation of the travelling time and visit duration, the travel valuation of motorists in recreational traffic was used. A fixed kilometre rate of 19 eurocents was the basis for calculating the travel expenses.

Apparently, physical visitors find that the benefits of a visit balance out these integral costs. In the starting scenario, it is assumed that the user benefits of a visit are 25% higher than the integral costs referred to above.²³ Subsequently, the assumption is that users are set in motion when the surplus they experience from the one activity is at least 25% higher than the surplus of the alternative. The *increase* in the *surplus* is then equal to the welfare gain the user experiences. Translated into a sum: if the integral travel and accommodation costs for a user are € 80, then it is assumed that the integral user benefits amount to 125%, i.e., € 100. Thus, the surplus is € 20. Subsequently, it is assumed that for an alternative leisure activity for a Sunday afternoon, the surplus would have been 25% (i.e., € 5) lower. The welfare gain for the additional physical visitor is thus this € 5, or $\frac{1}{16}$ of the integral costs of the visit. This welfare gain is then added up for each visitor across all Dutch visitors to the consortium partners, depending on the assumed increase in the physical visits. An increase in surplus for tourists was not taken into consideration in the calculation given the national focus of the analysis. The net present value of this total welfare gain as a result of the increase in physical visits amounts to € 13.1 million (at 2007 values).

Alongside this additional surplus for the physical visitors, the additional visits also create additional revenues for the consortium partners in the form of additional ticket sales and possibly shop and food and beverages sales at the institution. In this regard, the assumption is that the marginal profit on tickets is 50%, on expenditures in the museum shop 20% and in food and beverages in the museum 10%. Costs also have to be incurred to accommodate the additional visitors and additional demand in the museum shop and for food and beverages. Furthermore, it is assumed that the spending pattern of the additional visitors on tickets and other things is identical to the average for the current visitors, about whom data had been gathered. The spending of tourists is included in this calculation because these amounts contribute to the additional profit of the consortium partners. The additional profit for the consortium partners over a period of 50 years amounts to € 33.6 million (present value in euros of 2007).

Against this additional profit for the consortium partners, however, there is a possible *loss of income* for other parties. For example, it could be that an additional visit to one of the consortium partners would be at the expense of a visit to another museum outside the consortium that for this reason is less visible, to an amusement park or theatre, to a café or restaurant, etc. The number of alternative leisure activities is large and the same applies to the number of alternative parties that could incur a loss of earnings.

²³ This is the consumer surplus. In competitive markets, a lower percentage is generally observed. There are, however, many indications that the surplus in the culture and heritage sector is considerably higher than in most markets, due among other things to the active policy of keeping prices low to keep the institutions accessible (cf. Marlet, Poort and Laverman, 2007).

However, this does not mean that all the benefits for the consortium that result from additional revenues are negated by losses elsewhere in the economy. In the first place, we are not dealing with a so-called zero sum game in which each additional euro received is at the expense of a euro elsewhere: the restaurant table that a visitor would have occupied if he/she were not to have gone to the museum may now be occupied by someone else. Moreover, a visit to a museum can actually encourage people to visit other museums as well (other museums then experience positive spillover effects). As long as the potential loss of earnings is small in relation to the turnover and scope of the parties involved, it appears plausible that its effect would be virtually extinguished. Secondly, cost-benefit analysis only looks at the *profit margin* on the revenues. This is assumed to be larger than the average margin for alternative leisure activities, because many alternatives lie in strongly competitive sectors such as the hospitality sector. Finally, for tourists who go to the consortium partners as a result of the project, the loss of earnings and profit ends up with foreign parties that lie outside the visual field of the cost-benefit analysis.

All in all, it admittedly does seem plausible that a proportion of the additional profit of the consortium partners is set against a loss for other parties but this loss is expected to be considerably smaller. In this cost-benefit analysis, the loss elsewhere in the economy is assumed to be 20% of the profit of the consortium partners. Added up over the lifespan of the project, this translates into € 6.7 million euros. Whether or not this could be regarded as a direct or indirect effect is somewhat arbitrary. Insofar as the loss takes place at other museums, it could be characterized as a direct effect on the market for museum visits. The situation is different when it comes to losses in the hospitality sector, amusement parks, etc. For this reason, the entire losses item is included in the analysis as an indirect effect.

Apart from the profit margin and the increase in surplus that are attendant on the expected growth in the number of physical visitors, there is also a third source of benefits. The digitization of the collections makes it possible to enhance the visiting experience. Material in storage can be displayed digitally to support material on exhibit, and cross-links with the collections of other institutions can be offered. Standing in front of the Night Watch, the visitor could, for example, receive information about what Vincent van Gogh wrote to his brother about the painting. The Rijksmuseum is considering doing this in the future by incorporating, for instance, an *audio tour* or *PDA tour* into the admission price: in this way, it can offer a more valuable experience against a slightly higher price. In this report, however, for the time being the assumption made is that an enhanced visiting experience would be offered without any actual rise in admission prices. It is assumed that the consumer surplus on the integral visiting costs (i.e., including travel time, time spent at the institution and travelling expenses) would increase by 1 %. In 2007 prices, this would deliver a total welfare gain of € 3.9 million over the lifespan of the project. Thus, we avoid having to take account of a slight fall in the number of visitors as a result of the higher prices (fall in demand) and the maximum welfare effect is best approached. The partial pruning away of the benefits is possible via higher admission prices, but primarily will create a transfer among the actors while a limited welfare loss takes place due to the fall in demand.

4.2.2 Virtual visitors

Alongside the growth in physical visits, virtual visits in particular will increase. This effect is difficult to express in euros: what is the social value of someone who visits a website and finds what he/she is looking for? In accordance with the project plan, for the valuation we assume that

a basic collection would be offered to the public at large free of charge.²⁴ The value that visitors assign to the digital collection is then measured against the time they spend in viewing or visiting it. The consortium partners were asked about the numbers of their current virtual visitors and the average virtual length of stay of these visitors, as well as about their expectations as to how these numbers will develop under the influence of the project. Box 4.2 gives a summary of the assumptions that were made on the basis of the responses received.

Box 4.2 Assumptions for growth figures in virtual visits

The following information and assumptions involve virtual visits.

- All the virtual visits data was supplied by the institutions.
- Where possible, creative visitors were deducted from the total number of visitors.
- The assumption was made that the proportion of foreign nationals among virtual visitors is higher than among physical visitors (the surplus from visitors from abroad is not counted). Based on the current origin data from the site of the Netherlands Architecture Institute, it was assumed that among virtual visitors, the share of Dutch visitors is a fifth less than among physical visitors.
- Regarding the length of visits to websites, the Rijksmuseum and the Netherlands Architecture Institute (NAi) both provided information about the duration of virtual visits: 6 minutes for the Rijksmuseum (= 0.1 hour) and 208 seconds for the NAi (= 0.058 hour on average, based on figures from 2006). For the rest of the institutions, the average of the two figures was used (= 0.079 hour).
- The Rijksmuseum has announced an expected virtual growth of 20% in year 1 up to and including year 5, making a total of 100%. It was assumed that this would also apply to the other institutions. Only the National Museum of Antiquities made its own growth estimate of a rise of 445,000 visitors and the NAi estimated growth at 20 to 50%, with 50% being adopted.
- Regarding the growth in the duration of visits to the sites, the Rijksmuseum predicted a growth of 50%, the NAi growth of 19%. For the rest of the institutions it was assumed that the growth in the duration of visits would be somewhere in between at 30%.

Analogous to the method that was used in the valuation of the physical visitors benefits, the assumption was made that virtual visitors would have a surplus of 25% on the so-called opportunity costs of their time. If the valuation for one hour is on average about € 5, the estimated value of an hour's visit to a site is then € 6.25. It was then assumed that additional visits to the site (additional visitors plus longer virtual visits) would have a 25% higher surplus than alternative leisure activities. Thus, the welfare gain related to an extra hour's visit to a site in this example sum comes to 25% of € 1.25, i.e., about € 0.32. These benefits are again aggregated across all domestic visitors to all the consortium partners. Subsequently, the benefits are given a present value (in euros at 2007 level), which delivers an amount of € 5.8 million.

4.2.3 Education sector

Netherlands Heritage: Digital! offers various possibilities to the education sector. The material could play a role in the development of digital teaching resources and digital source materials in the primary and secondary education sectors. These teaching resources and sources can, in principle, be developed by the consortium, teachers or third parties (e.g. educational publishers). The previous chapter already indicated that these applications will be assisted by the role that the *Canon of the Netherlands* will play in teaching and by the intended lump sum financing of school books in the secondary education sector (the so-called free school books). The threatening shortage of teachers could add impetus to the use of digital teaching resources.

²⁴ Added-value services, for example, in the education sectors and the creative industry could be offered against payment – more about this in the following (sub)paragraphs.

To be actually used by schools, the material that is developed by or based on the project should be made more appealing than current material, to those who make the decisions about the purchasing or use of teaching resources. In the first place, their (perceived) quality or alignment with the attainment targets could be better (e.g., by being perceived as better, more modern or more trusted). Any social benefits would, however, be quite difficult to quantify. Even if all parties involved were to agree that a new method based on *Netherlands Heritage: Digital!* is of better quality, it would not be possible to immediately determine how this would translate into social welfare effects. That is why the effects in this cost-benefit analysis have been related to costs savings that can be realised when schools and educational publishers make use of the material that the project offers.

Commissioned by the consortium, Bureau Berenschot conducted a survey among a large number of primary and secondary school teachers²⁵, aimed at finding out how much interest the education sector had in using digital heritage material as a replacement for or supplement to the current instruction material. In addition, the application of the content as source material was also examined.

The most important reasons for choosing to replace or supplement the current instruction material appeared to be that the digital heritage material is up to date, more contemporary, offers more opportunities for offering material visually and that it is more appealing and challenging for students.

Teachers who saw possibilities for *replacing* the instruction material or sources were asked about the amounts they were currently spending on the material to be replaced. When they envisaged a *supplementary* role for the material, they were asked about the price they were prepared to pay for such supplementary material. Table 4.1 below summarizes the outcomes of the Berenschot survey that are relevant to this CBA. The school subjects are divided into “Canon subjects” and “other subjects”. The percentages given indicate what proportion of the teachers regarded the project as a possible replacement for or supplement to the instruction material or source material. One important comment on these outcomes is that teachers who saw possibilities for replacing current instructional material did not have any opportunity for indicating whether they saw possibilities for using the material as a supplement. Therefore, the percentage of replacement plus supplementary use per category is nowhere higher than 100%. In reality, however, it is quite plausible that teachers who replace their instructional material with material based on *Netherlands Heritage: Digital!*, will also use the supplementary teaching resources that make use of the project.

Table 4.1 Summary of the Berenschot survey outcomes according to the interest and willingness to pay for heritage material in the education sector

		Primary Education		Secondary Education	
		Percentage	Euros	Percentage	Euros
Canon subjects					
Teaching method (per year group/department)¹	Replacement	50%	190	31%	125 ²
	Supplement	47%	100	68%	50
Sources (per school)	Replacement	61%	50	53%	100
	Supplement	37%	20	47%	62.5
		Primary Education		Secondary Education	

²⁵ Beerepoot *et al.*, July 2007: *Onderzoek Nederlands erfgoed digitaal voor het onderwijs*.

Other subjects					
		Percentage	Euros	Percentage	Euros
Teaching method (per year group/department)¹	Replacement	16% ³	300	7%	40 ⁴
	Supplement	81%	100	82%	60
Sources (per school)	Replacement	13%	118 ⁵	2%	100 ⁶
	Supplement	87%	50	89%	100

¹ For primary education, data on application as a teaching method is presented as figures per year group; for secondary education, figures are given per department.

² This figure is an indicative figure, based on the Berenschot study. It is likely that there is an upwards bias because the large majority of the teachers who answered, use the Canon material often. To compare: the amount that according to the research is now spent on Canon material is € 40 per department.

³ This is an estimate. This percentage is not given in the Berenschot study.

⁴ Based on the Berenschot study, nothing can be said about the value teachers assign to the replacement of current teaching methods by digital heritage. The estimate given here is based on the amount that is now being spent on Canon material.

⁵ The Berenschot study gives no median values. This figure is an average.

⁶ Based on the Berenschot study, nothing can be said about the value teachers assign to the replacement of current sources. This figure is based on the value that is assigned to the supplementing of the current sources and is therefore probably too low.

Source: SEO Economic Research based on Beerepoot et al., 2007. NB: The report by Berenschot indicates both the average and the median for all outcomes. The average is generally higher, but – especially given the limited scope of the response to some parts of the survey – is strongly influenced by extremely high (or low) answers, that could have been provided with a strategic purpose in mind. For this reason, this CBA is based on the median values.

Replacing instructional material at schools

As the table shows, the project can effect considerable financial shifts in the education sector. An important comment in this regard is, however, that the material as it will be developed within the project is not an end product that can serve as instruction material as such. Rather, the material is the *content* that can be used by third parties as a semi-finished product for developing instructional material. The end product must meet high didactic requirements, especially when the existing teaching material needs to be replaced.

It therefore seems more realistic to assume that a specialized sector, such as educational publishing houses, will use the material in developing new teaching material that meets the high quality requirements. The estimation is that 5 to 10% of the turnover in this sector is used for the purchasing and development of visual material, remunerations for authors, design costs and the like. Therefore, for the relevant teaching resources to be replaced, it is estimated that no more than 3 to 5% of the turnover will be available for the purchasing of the digital heritage material. For this reason it is assumed that on average 4% of the relevant budgets will be available for buying the digital heritage material (cf. Table 4.2).

On the other hand, when access to the material has a low threshold (either free of charge or against payment) for the developers of teaching resources, virtually the entire sector will make use of the material. In other words: in the future, for the relevant subjects, education institutions that now indicate that they see no replacement possibilities are also expected to use teaching resources in which intensive use is made of the heritage material. The conservative estimate that on average only 4% of the replacement budgets mentioned will be available along this path for the purchasing of the material from *Netherlands Heritage: Digital!* is, therefore, countered with the optimistic assumption that in the long term, the entire market will make use of the material for the relevant subjects.

Supplementing instruction material at schools

Alongside replacement use, many teachers see possibilities for supplementary use. In this regard, they also indicate a concrete willingness to pay. This suggests that the teachers see an added value in spending additional resources in order to use the material in lessons. A service such as Teleblik could be an option. In less than a year this service generated some 4150 users with some 83,000 visits per month.²⁶ As mentioned above, *only* the teachers who saw no possibilities for replacement use could indicate whether they saw possibilities for supplementary use. On average, approximately 90% of this group (94-98% for the Canon subjects and 81-82% for other subjects) gave a positive response. This CBA assumes that this average of 90% also applies to the teachers who would consider replacement use.

The expectation is that for supplementary use too, the material developed within the project will need further refining. Given that the material will be used as a supplement, the assumption is, however, that the requirements for this refinement will not be as high as for the replacement teaching material. As a result, a larger proportion of the indicated willingness to pay would be available for the purchasing of the material. The starting point in the calculation is that for supplementary use, 25% of the willingness to pay can be used for purchasing the material. In other words: the assumption is that the exploitation and refinement of the material for supplementary use will amount to 75% of the total costs. In light of the experiences with Teleblik this seems a reasonable assumption.²⁷

Supplementing and replacing source material at schools

Finally, many teachers also see possibilities for using the material to replace or supplement source material.²⁸ The assumption in this regard is that the amounts mentioned apply per school/education institution and (access to) the digital material is offered at a central location such as an information centre. In addition, it is assumed that the project material will be in a sufficiently user-friendly and searchable form, so that it can be offered without further refinement. Therefore it is assumed that the totals mentioned can be attributed to the project as benefits. Table 4.2 summarizes the assumptions in the interpretation of the Berenschot survey.

Table 4.2 Assumed consortium revenues

% of schools × % of budget per group/section = % of total budget		Primary Education	Secondary Education
Teaching method all subjects (per group/section)	Replacement	100% × 4% ¹	100% × 4% ¹
	Supplement	90% × 25% ¹	90% × 25% ¹
Canon subjects sources (per school)	Replacement	61% × 100%	53% × 100%
	Supplement	37% × 100%	47% × 100%
Other subjects sources (per school)	Replacement	13% × 100%	2% × 100%
	Supplement	87% × 100%	89% × 100%

¹These percentages are explained in the text and are not based on the Berenschot study.

Source: SEO Economic Research based on Beerepoot et al., 2007

To arrive at the concrete social benefits that are generated by the valuations and percentages mentioned, the percentages in Table 4.2 are multiplied by the corresponding amounts in euros in

²⁶ *Beeld en Geluid* (2006). Teleblik – Interim report, 2006.

²⁷ According to the operating bill for 2006, about 23% of the costs of Teleblik were spent on the collection.

²⁸ Source material with added value above that of the material that is accessible to everyone via the internet.

Table 4.1 (the teaching methods for Canon subjects and other subjects are added together). Subsequently, the numbers are converted to the national level by multiplying them by the number of schools, groups or sections in the whole of the Netherlands.

Parents and instructional material

A component that is not considered in the Berenschot survey is the money that *parents* spend on books in the secondary education sector. In the primary education sector the schools pay for the teaching materials, in the secondary education sector parents (for the time being) have to buy the necessary books. On average, an annual amount of approximately € 308 per student is spent on books.²⁹ An estimated 5 to 10% of this amount is spent on the purchasing and development of visual material, remunerations to authors, design costs and the like. For some subjects that make intensive use of Canon subjects, such as history, a relatively high percentage could be spent on purchasing digital material. Other subjects for which the Canon is of less importance, such as maths, will spend much less on digital heritage material. On average, it is assumed that across all the subjects in secondary education, 1% of the purchasing budget would be available for the digital material of the consortium. This corresponds to some € 3 per student per year.

In total, the welfare gain for the primary education sector from this path, with a present value in euros of 2007, comes to € 30.2 million, and to € 39.9 million in the secondary education sector. The total education benefits amount to € 70.1 million.

4.2.4 Use in science

The digitization of cultural heritage is also expected to have beneficial effects in the science sector. Researchers in the fields of language and culture will have digital access to sources that were previously difficult to reach, for instance, because they were in storage or too vulnerable to allow for broad access. In this way, researchers can carry out their research more easily and more productively. In addition, the digitization could open up new fields of scientific research that were previously unimaginable: the digital analysis of writings, visual art, archaeological objects and other art-history sources using specially developed software (text mining and image mining). It will be possible to conduct linguistic research on old hand-written texts, which without doubt will add impetus to certain types of research.

The social benefits of these uses are difficult to estimate. What is deeper insight into such aspects of the past worth to us? And what or how many new insights can we expect? An important feature of scientific research is precisely that such matters are to a large degree unpredictable. Assigning a monetary value to new fields of research is difficult and subject to discussion. An alternative approach that is often used in CBAs, starts from costs avoided: what are the costs of such activities with and without the project, and what costs savings can thus be realized? Using this reasoning, for the National Library of the Netherlands and the National Archive the assumption is that 10% of the physical scientific visits in the future could take place digitally.³⁰ These visitors save on travelling time and travelling expenses. The net present value of this substitution effect amounts to 20.6 million euros.

²⁹ Salm, H. (2007). *Meer geld nodig voor gratis boeken; Scholen: 308 euro per leerling is te weinig. Vrees voor verouderde lesmethoden*. Trouw: PCM publishers.

³⁰ Based on the experiences so far at the National Library of the Netherlands with offering the collection digitally, it was assumed that on balance this would *not* lead to a drop in the number of physical visitors. The attention value of the digital collection, after all, generates new demand, as was also assumed for the other institutions. In this analysis, the assumption is that the substitution and the increase in demand would on balance lead to a number of visitors that would remain stable.

The positive social effect when digital material opens up entirely new research methods is calculated differently. Research methods that, on the basis of the physical sources, were too labour intensive are rendered feasible with the use of digital sources, but this does not mean that the fictitious time savings can be recorded as a benefit. After all, in the past a great deal of labour-intensive research was not conducted because the return was too low.

The perspective from which we attach a value to scientific use here assumes that the current budgets for language and cultural research approximately reflect social preferences. The social return of an additional euro for such research will therefore be approximately equal to that of alternative government expenditures. Subsequently, we examine the expected increase in productivity that the project could create for researchers who use the digitized material.

Each year, Dutch universities conduct 1200 labour years of scientific research in the fields of language and culture, which translates into a total expenditure of 157 million euros.³¹ Of this total, probably only a small percentage will make very intensive use of the project. The (presumably somewhat optimistic) assumption is a percentage of 5%, i.e., 60 labour years.

The increase in productivity within this relevant percentage was estimated by examining the increase in the internet use of researchers as a result of the material that is now available online. According to research, the productivity of a researcher increases by approximately 3.5% (measured by the number of scientific articles published) when he/she uses the internet 10% more (Kaminer & Braunstein 1998; Barjak 2006). Based on the assumption that the researchers for whom the digitization of the cultural heritage is relevant will make 20% more use of the internet as a result of the digitization, the expected increase in productivity of this group is 7%. For the intensive users of *Netherlands Heritage: Digital!* this comes to an annual overall improvement in productivity of some € 500 thousand. When a sensitivity analysis is based on more pessimistic/optimistic assumptions and the cash flows are subsequently monetarized to a current value, this corresponds to a net present value of between € 2 and 8 million.

4.2.5 Creative industry

The final user group involves the creative industry. As indicated in paragraph 3.2.3, this sector actually is a patchwork of companies and small enterprises that are involved in a multitude of activities. Some of these companies are already making intensive use of the facilities of the institutions in the consortium. Insofar as commercial visitors are seeking specific information, it was assumed that their visits as a result of the project can be completely obviated by virtual visits. So, for this group, physical visits are substituted by virtual visits, whereby costs are saved in travelling time, travelling expenses and on admission tickets.³² A complicating factor in this calculation is that little information is available on the current numbers of commercial visitors who visit the institutions for specific information, as the total figures for commercial visits also often comprise many staff outings, conferences and visits intended to entertain clients. The possible growth in commercial visits (with a higher time valuation than visits by private individuals) is already included in the data on physical visits.³³ Therefore, depending on the

³¹ Statistics Netherlands (CBS), 2003.

³² For the consortium, the savings on admission costs then lead to a slight fall in revenues from the sale of tickets.

³³ For the National Archive, the share of creative/commercial visitors was estimated at 40% of the total, for the Rijksmuseum at 15% of the total number of visitors.

nature of the heritage institution, the assumption is that 5, 10 or 100% of commercial visits will shift to virtual visits (for example, 5% for the Rijksmuseum, 100% for the National Photography Museum). This shift creates benefits with a net present value of € 11.8 million.

In the calculation of the total benefits, it was further assumed that the consortium, which intends to charge a market rate for this user group, will be able to prune away half the costs saved. The remaining half of the savings benefits the creative industry, in which an increase in the demand that could result is abstracted.

Furthermore, the aim was to set out the social benefits related to a number of entirely new applications that the digital industry could develop based on the material.

Sales to tourists

Such applications could, in the first place, include added-value services for tourists, for example, interactive travel guides or tours for a GPS-guided PDA,³⁴ DVDs with cultural highlights from Holland, vodcasts that can be bought at Schiphol or the airport of departure in preparation for the journey, and the like. The average real sale price for such novelties is assumed at € 10. Of this sale price, an average of 10% is available as payment for the use of the heritage material. For the rest of the commercial sector, a profit of 5% of the sale price is assumed. The net social benefits these products generate thus total 15% of the turnover.

The next question is what would be a realistic estimate market for such products. To this end, tourist statistics were examined. In 2006, 10.7 million tourists visited the Netherlands for a stay of at least one night. According to a study pertaining to 2005, approximately 63% of tourists travel to the Netherlands for a holiday.³⁵ A considerable proportion of them mention visits to museums or places of historical interest as an important holiday activity. Of those who indicated they considered other activities to be more important, a large number visited a museum *en passant*. Museum visits were the main activity for 8%, while 31% indicated occasionally visiting a museum; 37% visited places of historical interest and for 10% visiting places of historical interest was the main activity. In answer to the question of how they would characterize their holiday in the Netherlands, 13% of the holidaying tourists stated they were on a “cultural holiday”.³⁶

The assumption is that tourists who travel to the Netherlands primarily to visit museums and places of historical interest, constitute the most important target group for added-value services. This category comprises 18% or 1.9 million tourists each year. It is assumed that 10% of this group would spend € 10 on a vodcast or DVD. On average this involves an expenditure of € 1 per cultural tourist.³⁷ When calculating the present value of cash flows, it was then assumed that tourism to the Netherlands grows by an average 3% per year. The net present value of these sales

³⁴ This could include location specific cultural-historical information.

³⁵ Netherlands Board of Tourism & Conventions (NBTC), November 2006: *Destinatie Holland: De buitenlandse toerist beter bekeken*. In 2005, the number of multi-day tourists was 10.01 million with an average length of stay of 2.5 nights. On top of this, according to the NBTC, tens of millions of day-trippers (mainly from Germany and Belgium) visited the Netherlands.

³⁶ Research by the Netherlands Board of Tourism & Conventions (NBTC) shows that in 2005, 69% of tourists had consulted the internet when preparing for travel. In many cases the sites visited involved accommodation and carriers but significant numbers visited sites such as www.holland.com (26%), sites about cities and regions (25%) and sites about places of interest and events (21%). In 2005, the internet thus played a key role in travel preparations and it seems safe to assume that this role will only grow in the years ahead.

³⁷ Another, probably even more conservative interpretation of this same assumption could be that about 1 in every 30 tourists who visit a museum or historic site makes a purchase. Here it is assumed, however, that the expenditure does not compete with the other expenditures made during the trip to the Netherlands.

to tourists thus comes to € 7.2 million. It is worth noting that the many millions of day trippers, mainly from Germany and Belgium, were not taken into consideration. The effect of the project on the *number* of tourists who visit the Netherlands annually is set out in paragraph 4.3.

Integration and naturalization

Another possible application of the heritage material is in the area of naturalization meetings and citizenship exams. Since 1 January 2006, “holding a meeting with a ceremonial nature for those who have opted for the Dutch nationality or have become citizens through naturalization has had a more mandatory character for the municipalities”.³⁸ Participation in these meetings is now compulsory for naturalized persons. On its website, the Ministry of Justice sets out the aim of the ceremony as follows: “Express attention can be paid to the acquisition of Dutch citizenship in a festive ceremony. In this way, new Dutch citizens can be welcomed more warmly. This can have a positive effect on the rest of the social integration process. Becoming Dutch and a citizen of this democratic legal system is an event of which new Dutch citizens can be proud. Conversely, the Netherlands is pleased by the fact that people choose to become Dutch.” The content of the ceremony is in part up to the municipality concerned. Many municipalities give new Dutch citizens a gift, such as a porcelain Delft blue potato, a flag, a booklet containing historical and government information, the constitution, a set of pens, and the like. This would be an ideal use for material derived from *Netherlands Heritage: Digital!*, such as a DVD or booklet. Assuming each new Dutch citizen receives a gift worth € 10, of which 10% is used for heritage material (€ 1 per naturalized person) over the lifespan of the project this would deliver relatively limited benefits of € 0.3 million.

There is a clear opportunity for use of the heritage material in the citizenship courses and citizenship exam abroad that have been mandatory since 2006 for immigrants from outside the EU who desire to acquire a residence permit. Participation in the exam costs € 350 and the preparatory written and audio-visual course material published by ThiemeMeulenhoff costs about € 63.90. In the first year, over 4400 candidates sat for the test.³⁹ In total, some 15 thousand practice kits were sold in that first year, in the final months about 1000 per month. This figure is more in line with the annual 14 thousand candidates the Ministry of Justice had expected.⁴⁰ If, in line with educational use, it is assumed that 2% of the turnover is potentially available for the purchasing of Canon material, over the lifespan of the project this corresponds to monetarized benefits for the consortium of € 0.2 million.

4.3 Indirect effects

4.3.1 Tourism

The previous paragraph discussed the direct effect that *Netherlands Heritage: Digital!* could have on the expenditures of tourists on a DVD, vodcast or PDA tour. In addition to this effect, the project could, however, have a small positive impact on the number of tourists who travel to the Netherlands each year. Improved digital access to the Dutch culture and heritage collection could have a positive impact on the number of cultural tourists who travel to the Netherlands. The innovative services for cultural tourists mentioned above could bolster this growth. An increase

³⁸ www.justitie.nl.

³⁹ www.postbus51.nl.

⁴⁰ Immigration and Naturalization Department, 2007: *Monitor Inburgeringsexamen Buitenland, April 2007*, p. 7.

in the number of tourists travelling to the Netherlands as a result of the project will also generate additional revenues in other sectors of the economy: revenues for Dutch airlines, for Schiphol airport, for hotels and for restaurants. The additional tourists bring with them to the Netherlands their entire tourism expenditures. Needless to say, costs will be incurred on Dutch soil to produce the required products and services and the profit margin or the product surplus will remain as a welfare gain.

How many additional tourists the project could generate for the Netherlands is very uncertain. What we do know is that large, persisting effects are unlikely because other countries will also increasingly improve access to their heritage collections. Moreover, as a result of the project, a tourist may visit the Netherlands one year earlier than he/she would have otherwise, and consequently opt to go elsewhere the next year: thus, what takes place is mainly a shift in time.

This cost-benefit analysis uses the number of tourists who mentioned a visit to one or more museums as their main activity as a starting point. The previous paragraph already indicated that this represents some 8% of the total annual flow. We assumed that the annual growth in the number of tourists would be 3%.⁴¹ Subsequently, in the basic scenario it was assumed that this project will result in a sustainable increase in the number of cultural tourists of 1%.

In 2005, the ten million tourists together spent some € 3.5 billion on their holidays, € 2.9 billion of which was spent during their stay.⁴² Per capita this comes to expenditures of € 354 per stay. In this regard it should be noted that visitors from more distant places – who have a greater tendency to visit museums and places of historical interest – spend on average more per person. Furthermore, the calculation assumes that the social profit margin on services to tourists amounts to 10%. The net present value of this indirect effect is thus 7.6 million euros.

4.3.2 Other indirect effects

Apart from an indirect effect on tourist expenditures in the Netherlands, the project could have various other indirect effects. By mainly employing staff with a low education level, unemployment in the lower segment of the labour market could be slightly reduced.⁴³

Furthermore, the international competitive position could be strengthened by a flourishing creative sector and the increased use of broadband infrastructure that could arise from the project. The Dutch ICT sector could also profit from the project. The expertise gained in the project can be capitalized on elsewhere (knowledge spillovers) or could lead to falls in costs. In addition, other countries may have a need for the developed expertise, resulting in a rise in profits. Possible (surplus) profits for the implementers of the project are regarded as indirect social benefits, although it is essential to keep this margin low through sound tendering.⁴⁴

Paragraph 4.2.1 already indicated that a negative indirect effect is expected insofar as the profits of other museums, theatres and amusement parks fall as a result of the project.

⁴¹ The growth from 2006 to 2007 was 7% but this can be attributed in part to the Rembrandt anniversary and the growing number of cheap airlines.

⁴² The rest was paid in advance and mainly involved transport costs and overnight stays.

⁴³ This line of reasoning is elaborated in the box on page 33 in Hof, Korteweg and Poort, 2006: *Baten in beeld*.

⁴⁴ The *turnovers* of the implementers are not social benefits because, especially in the ICT sector, it is not plausible that the implementers would be sitting back doing nothing if there were no project. Therefore, the project draws production factors away from elsewhere in the economy and, moreover, the prices of some production factors are rising which is to the disadvantage of third parties.

Other negative indirect effects ensue from the costs of taxation. Taxation has various disruptive effects on the economy. Firstly, as a result of income tax, consumers can purchase fewer goods, reducing their benefit. Secondly, users pay more for goods and services than the production costs for manufacturers, because of, for example, VAT. Consequently, consumers and companies make different choices about how many and which goods and services will be purchased. Thirdly, the choice between work and leisure time is affected. In principle, working is less attractive but a reduction in income can stimulate people to work more. Due to these changing choices of people, allocative efficiency is no longer created and the result is a welfare loss. This welfare loss constitutes additional costs of taxation. The costs of an additional unit of government resources is then greater than one. Moreover, the collection of taxes involves implementation costs and administrative burdens.

The costs of the disruptive effect of taxation land on “third parties”, in this case citizens and companies throughout the Netherlands; they are estimated to amount to 15~40%.⁴⁵ The costs of the tax that is received as a result of the impetus to spending generated by the project (e.g., income tax on paid incomes, VAT, corporate income tax) should be deducted from the taxation costs. If 40% of the taxation costs is assumed in this regard, then on balance a premium would remain of 9~24 % of the requested subsidy.

4.3.3 Total indirect effects

As already indicated, the effect on the flow of tourists to the Netherland is cloaked in a great deal of uncertainty. Because indirect effects in cost-benefit analyses are often surrounded by large margins of uncertainty, these effects are generally calculated with a bandwidth of 0-30%. The lower limit that is observed in the final presentation could subsequently be higher, insofar as direct effects have been made plausible.

4.4 External effects

The external effects of the project are related, among other things, to abstract concepts such as enhancing cultural participation, strengthening historical and cultural-historical awareness and thus bolstering democracy. The project could also further multi-media literacy, which could contribute to raising labour productivity and the achievement of the Lisbon goals.

A relevant element in the Lisbon goals is the i2010 strategy, launched by the EU in 2005. i2010 is a strategic framework aimed at encouraging Europe’s digital economy and at creating a Single European Information Space. One of the initiatives within this framework is the Digital Libraries Initiative that in the coming five years will digitize at least six million books, newspapers, manuscripts, photographs, archives and other media. The project will make a significant contribution to this initiative.⁴⁶

⁴⁵ Based on: Nooij, M. de & C. Koopmans (2004), The welfare cost of taxation: the missing cost in cost benefit analysis? A critical note, SEO discussion paper no. 27, Amsterdam. Cf. Hof, Korteweg and Poort, 2006: *Baten in beeld*.

⁴⁶ Cf. http://ec.europa.eu/information_society/activities/digital_libraries/index_en.htm. It is arguable whether this should be considered a direct, indirect or external effect. It is, however, clear that it is difficult, if not impossible to attach a value to the contribution of the Digital Canon to the Digital Libraries Initiative.

The previous chapter also mentioned that the project could create positive spillovers for third parties such as libraries and heritage institutions that are not participating in the consortium. They could profit from the returns to scale and learning effects achieved in the project.

All these effects are difficult to quantify and altogether monetarizing is a risky business. It is, however, safe to assume that the external effects of this project are merely positive. Unfortunately, nothing can be said about the scope of the positive external effects.

4.5 Summary

This chapter discusses the direct, indirect and external effects that are expected to result from the *Netherlands Heritage: Digital!* project. The direct effects are subdivided into effects on and from physical visits, effects connected to virtual visits, and effects in the education sector, science and the creative industry. When quantifying and monetarizing these effects, a great many assumptions have to be made. The following chapter presents the net present value of the effects in the basic scenario and examines the sensitivity of the major assumptions used.

The indirect effects are, in the first place, connected to an increase in the number of cultural tourists who come to the Netherlands as a result of the project. The scope of this tourist flow is very uncertain. In addition, (limited) negative indirect effects are expected for alternative leisure activities undertaken as a result of the project (museums outside the consortium, cafés and restaurants, etc.). The project is expected to generate a number of external effects that are, however, so abstract that quantification (let alone monetarization) was not possible.

5 Outcomes and conclusions

5.1 Overview of monetarized effects

Table 5.1 gives an overview of the project effects discussed in the previous chapter. Wherever possible, the effects have been monetarized and their present value is expressed in euros of 2007; the costs of the project and the required subsidy are listed as memorandum items. The table is divided into direct, indirect and total effects. In the starting scenario, the overall social benefits amount to between € 172 and € 223 million, the median of this bandwidth is € 197 million. The direct effects are estimated at 171.2 million and the indirect effects are estimated to be between € 0.9 and 51.3 million.

About one-third of the direct benefits (€ 57.2 million) is related to the expected increase in physical and virtual visits. Less than half of this increase is attributed to Dutch users (the public at large € 17.8 + 5.8 million) and slightly more than half to the consortium (€ 33.6 million) in the form of additional receipts and revenues from the museum shop and the like.

Almost half of all the direct benefits are found in the education sector (€ 70.2 million). In this regard, transfers and the distribution of these benefits have not been considered for the time being. As shown in the table, all the benefits go to the education sector that consequently will have access to the material free of charge. Furthermore, there are considerable direct benefits (€ 25.2 million) expected for scientific users of the material. This can largely be attributed to the substitution of virtual visits for physical visits, resulting in savings in travelling time and expenses (which also results in a small loss of earnings for the consortium). Moreover, once old texts have been made digitally searchable, new research methods and areas will be developed which will lead to a growth in the productivity of a number of language and culture researchers.

The use of the material by the creative industry is expected to deliver social benefits of € 18.6 million. Some of this is again linked to the substitution of virtual visits for physical visits and some to new applications, aimed, for example, at tourism. A considerable proportion of these benefits can come to the consortium in the form of user payments. Finally, for naturalization ceremonies and citizenship courses, the heritage material can serve as “raw material” for the development of course materials and gifts. The expectation is, however, that the possible benefits from this will be limited (approximately € 0.4 million).

The indirect benefits are estimated at a minimum of € 0.9 million and a maximum of € 51.3 million, whereby the lower limit is determined by the balance of the calculated benefits from additional tourism generated by the project and the loss of earnings for alternative leisure activities such as other museums, events and the hospitality sector, whose popularity may fall slightly as a result of the project. The upper limit is set at 30% of the total benefits. The external benefits are positive but could not be quantified.

Table 5.1 Calculated present value of the effects of *Netherlands Heritage: Digital!*

	Consortium	Public at large	Education	Science	Creative industry	Rest of society	Government	Foreign tourists	National total
Direct effects (market for culture/heritage information)									
Digitization costs	- m.i.								- m.i.
Public at large physical visits									
physical visits turnover (admission)	52,3	-24,9						-27,4	27,4
physical visits costs	-26,1								-26,1
shop/hospitality turnover	50,6	-24,8						-25,8	25,8
shop/hospitality costs	-43,1								-43,1
physical visits user benefits		279,5							279,5
physical visits additional costs		-173,9							-173,9
consumer surplus loss alternative activities		-41,9							-41,9
increased consumer surplus all visitors due to richer museum experience		3,8							3,8
Total public at large physical visits	33,6	17,8						-53,2	51,4
Digital public at large									
digital visitors user benefits		115,2							115,2
digital visitors costs		-92,2							-92,2
consumer surplus loss alternative activities		-17,3							-17,3
Subtotal public at large digital visits		5,8							5,8
Educational use	0,0		70,2						70,2
Scientific use (revenues from productivity increase)	-0,5			25,2					24,7
Use in citizenship courses and naturalization									
heritage material margin on naturalization ceremony gifts	0,3								0,3
citizenship revenues	0,2								0,2
Subtotal citizenship & naturalization effects	0,4								0,4
Commercial-creative use									
creative production revenues					48,3			-48,3	48,3
production costs					-41,0				-41,0
content purchased from consortium	4,8				-4,8				0,0
fall in creative sector physical visits through digital access to material	-0,3				11,8				11,4
creative sector user payments 50%	5,9				-5,9				0,0
Subtotal commercial-creative effects	10,4				8,3			-48,3	18,6
Subsidy	+m.i.						- m.i.		0,0
Subtotal direct effects (excluding digitization costs)	44,0	23,6	70,2	25,2	8,3	0,0	0,0	-91,1	171,2
Indirect effects									
Growth in tourism									
revenues from additional foreign tourism due to digital canon						75,9		-75,9	75,9
costs of delivering services/products to tourists						-68,3			-68,3
Loss of earnings alternative leisure activities									
Labour market						-6,7			-6,7
Improvement of international competitive position						+?			+?
Total indirect effects excluding tax costs						+?			+?
Tax costs						- m.i.			- m.i.
Subtotal indirect effects excl. tax costs						0,9-51,6			0,9-51,6
External effects									
Preservation of culture									
Raising cultural awareness						+?			+?
Strengthening democracy						+?			+?
Contribution to Lisbon goals						+?			+?
Contribution to the Digital Libraries Initiative						+?			+?
Increase in multimedia literacy						+?			+?
Knowledge spillovers and returns to scale for third parties in the development of the information architecture						+?			+?
External effects subtotal									
Total balance excluding digitization costs and taxes	44,0	23,6	70,2	25,2	8,3	0,9-51,3	0,0	-91,1	172,0-222,5 +?

m.i. = memorandum item

Source: SEO Economic Research

5.2 Sensitivity analysis

Table 5.2 indicates the most important sensitivities in the outcomes. Optimistic and pessimistic assumptions were calculated around the basic assumptions for the most sensitive parameters, as discussed in Chapter 4. An exception is the discount rate. As discussed in Chapter 2, for this parameter the sensitivity was only examined when a halved risk premium was assumed. The reason for this is that the education sector is the largest individual source of benefits in this analysis, and there are good arguments for assuming that benefits relating to the education sector involve less risk than the general economic trend. Additionally, the discount rate is the most sensitive parameter: a 1.5% lower discount rate leads to some € 57 million in additional benefits.

Table 5.2 Sensitivities of the most sensitive assumptions

	<i>Pessimistic</i>	<i>Current</i>	<i>Optimistic</i>	<i>Pessimistic</i>	<i>Optimistic</i>
Consumer surplus	10%	25%	40%	-11.9	11.8
Discount rate		5.5%	4.0%		57.0
Increase in demand due to project	-50%	1	+100%	-26.4	52.7
Adult price/average price ratio	-50%		+50%	-14.4	14.4
Savings users in creative industry (via creative commercial)	-50%		+100%	-5.3	10.6
Profit margin on additional admission tickets	25%	50%	75%	-12.7	12.7
10% science – National Library, National Archive	5	10	15	-10.1	10.1

Source: SEO Economic Research

5.3 Variation in project scope

Many of the expected effects of *Netherlands Heritage: Digital!* in this study cannot be linked on a one-to-one basis with the scope of the project expressed in the numbers of objects that are to become digitally accessible. After all, once a certain ambition level is reached in the digital access of the heritage material, many effects will no longer be directly dependent on the objects and writings in the databases, as long as these are considered to be “more than sufficient” for the specific application. In the survey conducted among education institutions, for example, Berenschot does not mention numbers of objects. Instead, the ambition level is outlined and several interesting examples are presented. Based on this, the respondents formed a picture of the project and its usability for the education sector. For the effect on physical visits and tourism too, the scope of the project will only be of limited influence, provided the project retains its image and sufficient cohesion is offered between the collections of the participating institutions.

All of this means that the scope of the project as shown in Box 3.1 can be expected to vary, without a proportional variation in the social effects. The consortium, therefore, needs to seek the scale that provides the most favourable ratio of costs to benefits, independent of the question of what the final ratio of costs to benefits is for the project scope shown in Box 3.1. In the optimum case, this could result in a considerably smaller project, as long as it continues to meet the expectations of the major stakeholders: the education sector, science, the public at large and the creative industry. The selection of the most valuable pieces obviously is of great importance in this regard.

The expectation is that the project scope – in terms of the amount of material to be digitized – regarding educational and tourist-oriented use can be varied with relative impunity. For scientific

use, however, the situation is quite different. The scientific value lies largely in the amounts of material that can be searched digitally; often it is relatively unknown material that holds the most interest from a scientific point of view.

To a lesser degree, the expectation is that the benefits of additional virtual and physical visits will fall if the amount of material to be digitized is reduced. The “long tail” phenomenon could play a role here, particularly for virtual visits. This principle stems from Chris Anderson’s bestseller *The long tail*. The theory is that companies such as Amazon, Rhapsody and Netflix, that offer a virtually unlimited number of books, CDs or DVDs, derive a large proportion of their turnover from “obscure” titles that are not available elsewhere. One-quarter of the turnover of Amazon is derived from books that are not on the top-100,000 list.⁴⁷ Translated into the demand for heritage material among the public at large, this means that a not insignificant section of the public is interested in precisely the least known part of the collection. That is why virtual visits in particular are expected to suffer if fewer objects are given digital accessibility.

5.4 Legitimacy and recommendations

- In so far as the consortium receives monetary benefits, it would be obvious to set these off against the subsidy. After all, making money on this project is not the consortium’s aim.
- The benefits that arrive elsewhere in the economy are a more complex matter. The benefits of use for the public at large that in the calculations arise from consumer surplus cannot be used to the benefit of the project. Such benefits that are distributed across society but cannot be collected or can only be collected against high transaction costs, constitute a legitimization of the use of public funds. This also applies, for example, to the indirect benefits resulting from additional tourism.
- Benefits for the creative industry can never be entirely pruned away to benefit of the project either. Pruning away the revenues in order to reduce the need for subsidy is thus always in conflict with the desire not to frighten off potential users by high prices.
- Benefits for the education sector could probably be pruned away for the benefit of the project, which would mean that the required subsidy could become significantly lower. However, this should be arranged in such a manner as not to affect demand. A possible alternative model could be to immediately set off the expected benefits against the lump sum funding of the education institutions, while the material would be offered free of charge to schools as well as to educational publishers that could use the material in the production of instructional materials. This would prevent a welfare-lowering drop in demand as well as the creation of welfare losses by doubling the costs (publishers who develop material virtually identical to that offered within the project).
- The relationship between the intended project scope in terms of the numbers of objects to be released digitally and the calculated social benefits, is expected to differ greatly between the various effects. As long as the ambition level is retained and the project continues to meet the expectations of the education sector, the calculated educational benefits are virtually independent of the project scope. The same will apply to applications by the creative industry. Benefits that arise from scientific use and virtual visits, however, will fall significantly if the number of digitized objects decreases. The consortium needs to determine which project scope would deliver the most favourable ratio of costs to benefits. .

⁴⁷ Anderson, 2006: *The Long Tail: How Endless Choice is Creating Unlimited Demand*, p. 23.

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