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National Audit Office

**Memorandum**
prepared by the Comptroller and Auditor General
presented to the BBC Trust

**British Broadcasting Corporation**

# Digital Media Initiative

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British Broadcasting Corporation

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Memorandum prepared by the Comptroller and Auditor General
presented to the BBC Trust

This memorandum has been prepared under Clause 79(3) of the
Broadcasting Agreement between the Secretary of State for Culture,
Media & Sport and the BBC dated July 2006

Amyas Morse
Comptroller and Auditor General
National Audit Office

27 January 2014

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# Key facts

## £125.9m
BBC's estimate of spend
on the DMI

## £98.4m
BBC's estimate of the net
cost to licence fee payers

## 6 years
the time the BBC took to
plan, design and attempt to
build the DMI

**£133.6 million**    budgeted cost of the DMI (April 2007 to March 2017)

**184**    BBC staff and contractors working in the DMI
programme team at its peak

Note: all financial information in this report is expressed in cash terms

# Summary

## Our scope and purpose

**1**    In May 2013, the BBC cancelled its 'Digital Media Initiative' (DMI) after concluding that most of the £125.9 million it had spent on the DMI had been wasted. In this memorandum we summarise:

●    the BBC's aims for the DMI;

●    what went wrong;

●    where the money the BBC spent on the DMI went; and

●    what the BBC got in return.

**2**    Our findings are based on our high-level review that we carried out over four weeks during November and December 2013. We relied largely on the findings of existing reviews that the BBC and the BBC Trust prepared or commissioned, supplemented by our own review of key documents. These included technical reviews that the BBC commissioned from Accenture and a review of governance and project management that PwC carried out for the BBC Trust. We did not undertake extensive audit work to verify the accuracy of the information received.

## Overview of the DMI

**3**    The DMI was a major technology-enabled transformation programme that was designed to allow BBC staff and partners to develop, create, share and manage video and audio content and programming on their desktops. It required the development of a fully-integrated digital production and archiving system. It also needed a significant cultural change to standardise practices across television production in some of the BBC's main divisions that produce factual and current affairs programmes.

4    The BBC decided at the outset to build a custom-made digital system as commercially available products at the time did not support its aims for transferring digital files between production and archiving processes. The main elements of the proposed system were as follows:

- **Production tools.** This new software would enable production teams in some of the BBC's main television production divisions to share content for factual and current affairs television programmes, carry out basic video editing at their desktops and save partially completed work. Production tools would also allow users to transfer rough edits between their desktops and the BBC's professional editing facilities, while retaining any detailed information (known as 'metadata') associated with the files.

- **Digital archive.** The digital archive would provide a new online digital store for finished television programmes and other selected programme-making materials and information. The BBC's intention was to provide a more efficient alternative to storing archive material on magnetic tapes or other physical media. Production teams would be able to add detailed information (or 'metadata') about the content of digital files to make it easier to find archived material. The digital archive would be integrated with production tools to enable the automatic transfer of files and associated information between them.

- **Archive database.** The archive database would replace an existing system for cataloguing and managing physical archived content. The new system would be integrated with the digital archive to enable all BBC staff and third-party producers to search and order completed television programmes and related material held in the BBC's digital and physical archives.

5    We reported previously to the BBC Trust, in January 2011, on the DMI's progress at December 2010. The BBC contracted Siemens in February 2008 to build the system but the contract was terminated by mutual agreement with effect from July 2009. The BBC took responsibility for implementing the system in-house from September 2009 but did not assess the value for money and risks of this approach against alternative options. We recorded in our report that the BBC had started to implement the system and that users had been positive about the elements they had seen. We noted, however, that there was a considerable way to go to develop a technically complex system, which required integrating several independent elements without any time contingency. In addition, we noted that success would depend on take-up by users across the BBC. The BBC estimated that the DMI would cost £133.6 million and create financial benefits totalling £97.9 million from April 2007 to March 2017.

## Key findings

**6      When the BBC took over responsibility for developing the DMI system in July 2009 it had little time left to meet critical internal deadlines.** When the BBC contracted Siemens to complete the system by May 2009, it had envisaged that the technology would be ready in good time to support its move to Salford in summer 2011. The BBC took system development in-house, in summer 2009, after its contract with Siemens was terminated. At that point the BBC had used 18 months of development time without securing a working system. It estimated that the system would not be ready until February 2011, a delay of 21 months. By August 2010, it became clear to the BBC that its schedule would be delayed by a further five months to July 2011, which left no contingency in its timetable. From March 2011, emerging problems with the system and also unclear user requirements resulted in the BBC moving the completion date beyond autumn 2011, and beyond required dates, for example to support production teams relocating to Salford.

**7      The BBC completed the most straightforward of its new technology releases for the DMI but these proved not to be reliable indicators of progress.** The DMI programme team planned to implement the system in phases by issuing a series of technology releases that would successively add new capabilities. However, the BBC changed its technology release plans owing to technical and timetabling issues. In January  2010, BBC-commissioned consultants reported that plans for the DMI were superficial and lacked clarity about the scope of technology releases. We examined progress as at December 2010. We found that the BBC's plans did not map on to release schedules, which could lead to confusion about releases. We also found that planning processes for system development and testing were not strong enough to support the more complex integration of the system elements. Confusion about what each release was supposed to provide and the complexity involved made it difficult to establish what progress the BBC had made and what more it needed to do to complete the DMI.

**8      Technical problems and releases not meeting user expectations contributed to repeated extensions to the timetable for completing the system, eroding user confidence and undermining the business case.** In June 2010, BBC-commissioned programme management consultants reported that although there were several important issues to address, such as poor planning, there had been a positive reaction to the DMI components that the BBC had provided. However, as the project began to encounter further difficulty and delay, users lost confidence in the DMI to provide a reliable system that met their requirements. Some television production teams that relocated to the BBC's new site at Salford had to install alternative digital storage and adapt their editing technology to operate as stand-alone systems. As soon as this happened, the BBC's forecast of business benefits for a fully functioning DMI system started to erode.

9    **The BBC's management of the DMI was focused more on the technological aspects of the programme rather than enabling BBC-wide change.** To achieve the forecast benefits after building the system, the BBC would have to change its archiving and production processes. However, PwC found that DMI reporting focused on technology risks and issues rather than whether the programme could achieve operational change to business practices in the BBC. PwC concluded that the BBC executive's view of progress could have been more clearly informed by taking into account reporting by projects that depended on the DMI, such as the move to Salford, on the impact of delays in delivering the system.

10   **Governance arrangements for the DMI programme were inadequate for its scale, complexity and risk.** The BBC's decision to take the DMI in-house was high-risk. It needed to fill capability gaps to complete the programme by recruiting staff with the right skills or using third parties to deliver DMI components. Its plans also involved high levels of parallel development work to complete and integrate the system and meet important internal deadlines. Despite this:

- **The BBC did not appoint a senior responsible owner to act as a single point of accountability and align all elements of the DMI.** Future media and technology was responsible for developing the investment case, delivering and deploying the system, training users and achieving its share of the projected benefits. The divisions that would use the DMI, once delivered, were responsible for using the system and ensuring that it generated the projected benefits in their areas. The splitting of responsibilities across divisions and the absence of a senior responsible owner meant that differences between the expectations of those developing the DMI system and its intended users were not resolved. The BBC executive board noted when it closed the programme the need to ensure clear accountability for delivery in programmes like the DMI.

- **Reporting arrangements were not fit for purpose.** PwC found that the DMI did not provide clear and transparent reporting on progress against the plan, cost to complete, or achieving benefits to enable effective decision-making within the corporate governance structure. We found that there was also a six-month gap between a serious deterioration in the risk rating at the end of 2011 and when it was reported to the executive board, in June 2012, and the BBC Trust, in July 2012. This change in risk rating had, however, been reported to the finance committee in February 2012. In December 2013, following a review of governance arrangements across the BBC, the BBC announced it would introduce a new approach to speed up project reporting and identify issues earlier.

- **The executive board applied insufficient scrutiny during 2011 and the first half of 2012.** The DMI was not subject to any audit or assurance reporting, beyond reports prepared by the project management office, between early 2011 and July 2012. The BBC emphasised to us that during this period it was overseeing several other major projects, including the move to Salford and preparing for the 2012 Olympics. After the BBC executive board became aware of the problems, it initiated a review of the DMI timetable, costs and benefits in May 2012. At that point, the programme was 15 months behind the timetable in the business case approved by the BBC Trust. The BBC Trust finance committee raised concerns about progress when it was informed in July 2012 that the DMI's risk rating was red. When the executive board cancelled the DMI in May 2013, it identified a failure to recognise the severity of the issues in the reports they had received.

- **The BBC Trust questioned the executive in September 2011 whether delays might lead to the possibility of reduced benefits, but then applied limited challenge until July 2012**. The BBC informed the BBC Trust finance committee in September 2011 that the DMI's risk status had increased to amber-red. The Trust finance committee questioned the executive about slippages in achieving milestones but took assurance that there was potential for unforeseen benefits. The DMI's risk status increased to red for the period October to December 2011. A gap in reporting in the first part of 2012, which neither the BBC nor the BBC Trust addressed, meant that the Trust did not know this until July 2012.

11    The BBC did not adequately address many important issues identified by external reviewers during the course of the programme.

- **The BBC lacked sufficient independent assurance that its design for the DMI was technically sound.** It is standard practice in technical design to commission thorough independent technical assessments. We noted in our previous report that the BBC had not obtained an independent technical assessment of its design. The BBC did not take sufficient steps to implement our recommendation to complete an independent technical assessment. The assessment it received from its technical consultants in December 2010 examined only part of the system and was therefore incomplete. Additionally, the BBC took insufficient steps to address the significant remedial work that the consultants concluded was needed on the parts they examined.

- **The BBC was aware that business requirements for the DMI were not adequately defined.** The BBC's initial focus was on rolling out early technology releases to demonstrate progress, even though it had not established detailed user requirements for archiving and production. Unclear requirements subsequently resulted in delays, procurement problems and a lack of alignment between system development and the requirements of the archiving and production teams who would use it. BBC internal audit reported in July 2012 that the BBC had still not established a blueprint stating the required end-state for the system. A high-level internal review carried out by the BBC in August 2012 reported that although the purpose of the archive was understood, DMI requirements remained vague and production teams were indifferent about using production tools. Accenture, in a technical assessment for the BBC of part of the DMI, reported in March 2013, that the BBC was confused about what parts of the system were for.

- **The BBC did not revisit the business case.** In our January 2011 report on the DMI, we noted that the BBC's projections of the financial benefits had weakened. We therefore recommended that the BBC should resubmit programmes for approval where the delivery model, risk profile or cost–benefit projection changes. However, BBC internal audit reported 18 months later, in July 2012, that despite significant changes to the timetable and projected benefits, the BBC had not revisited the business case that the BBC Trust approved in April 2010.

**12   The BBC Trust approved the executive board's proposal to close the DMI in May 2013.**

- **The executive board halted work on most parts of the DMI in October 2012, other than the archive database which was already in use.** At that stage, the DMI steering group considered that the production tools software developed by the DMI programme team was potentially viable for use in programme-making and supporting some efficiency benefits. However, they had not yet been proven and the intended users of production tools had reported that they had no desire for further development owing to unclear business direction. The archive was still not complete. The executive board initiated a review of the BBC's future technology requirements for archiving and production and DMI outputs. This included commissioning an independent technical review of the parts of the DMI it had not already halted.

- **The executive board concluded that its original vision for integrated production tools was no longer valid, taking account of the delays and wider developments within the industry, and that it needed to revise its approach to developing a BBC-wide digital archive.** It therefore decided in May 2013 to retain the archive database but close the rest of the DMI programme. The BBC did not examine the technical feasibility or cost of completing the DMI. However, the BBC and the Trust concluded that owing to technological difficulties and changes to business needs, continuing the programme would be throwing good money after bad.

**13**    **The BBC estimates that it spent £125.9 million on the DMI.** The BBC offset £27.5 million of spend on the DMI against transfers of assets, cash and service credits that formed part of its financial settlement with Siemens. This left a net cost of £98.4 million. The BBC wrote off the value of assets created by the programme but is exploring how it can develop or redeploy parts of the system to support its future archiving and production needs.

## Conclusion

**14**    The DMI was a major technology-enabled transformation programme for the BBC. The BBC was too optimistic about its ability to implement it and achieve the benefits. It did not establish clear requirements for the system or obtain a thorough independent assessment of its technical design as a whole to see whether it was technically sound. Confusion about the content of technology releases and protracted problems with getting the system to work contributed to a growing gap between technology development and what system users expected.

**15**    The level of assurance and scrutiny that the BBC executive applied to the DMI was insufficient for a high-value and strategically important programme that involved significant risks. The BBC executive did not have a sufficient grip of the programme and did not appear to appreciate the extent of the problems until a late stage. If the BBC had established better governance and reporting for the DMI, it would likely have recognised the difficulties much earlier.

# Part One

## The DMI

**1.1**   This part describes:

- the BBC's aims for the DMI; and

- roles and responsibilities for approving, managing and monitoring the DMI.

### BBC's aims

**1.2**   The DMI was a major technology-enabled transformation programme that was designed to allow BBC staff and partners to develop, create, share and manage video and audio content and programming on their desktops. It required the development of a new, fully-integrated digital production and archiving system. It also needed a significant cultural change to standardise practices across television production in some of the BBC's main divisions that produce factual and current affairs programmes.

**1.3**   The BBC decided at the outset to build a custom-made digital system as commercially available products at the time did not support its aims for transferring digital files between production and archiving processes. **Figure 1** shows how the BBC envisaged the various components of the new system would work together. The main elements of the proposed system were as follows:

- **Production tools.** This new software would enable production teams in some of the BBC's main television production divisions to share and organise digital content for factual and current affairs television programmes, carry out basic video editing at their desktops and save partially completed work. Production tools would also allow users to transfer rough edits between their desktops and the BBC's professional editing facilities, while retaining any detailed information (known as 'metadata') associated with the files.

- **Digital archive.** The digital archive would provide a new online digital store for finished television programmes and other selected programme-making materials and information. The BBC's intention was to provide a more efficient alternative to storing archive material on magnetic tapes or other physical media. Production teams would be able to include detailed information (or 'metadata') about the content of digital files to make it easier to find archived material. The digital archive would be integrated with production tools to enable the automatic transfer of files and associated information between them.

- **Archive Database.** The archive database would replace an existing system for cataloguing and managing physical archived content. The new system would be integrated with the digital archive to enable staff and third-party producers to search and order completed television programmes and related material held in the BBC's digital and physical archives.

1.4 The BBC estimated that the DMI would cost £133.6 million to implement and provide financial benefits of £97.9 million up to March 2017.

### Figure 1
Original concept for how the DMI system would work

**The BBC's aim for the DMI was to fully integrate archiving and production processes**



**Capture**

Tape-less cameras capture video and metadata

**Archive**

**Digital archive**

Used to store audio and video clips or entire programmes. Users browse the database online, download content or save content from their desktops. Adding 'metadata' to files allows users to carry out detailed searches

**Archive database**

Holds detailed records of content in digital form and on physical media. Users can search the archive online or order stock held on physical media in the BBC's central archives

**Production tools**

**Work-in-progress: desktop production**

Desk-based production software for production teams to log and review new content, add metadata to describe it, share it, and complete initial editing. Rough edits are transferred electronically to editing suites for final editing

**Bundle and package**

Content is prepared for distribution to television, radio, online, mobile phones and other devices

**Editing suites**

Production teams carry out final editing in specialist production suites and then transfer completed files back to their desktops

**Supporting infrastructure and enterprise services**

Supports the transfer of digital files around the BBC

Source: National Audit Office diagram based on internal DMI programme documents supplied by the BBC

## Approving, managing and monitoring in-house delivery

**1.5**    **Figure 2** summarises the roles and responsibilities for approving, managing and monitoring the DMI as at June 2010. The executive board approved the final business case for the DMI on 12 April 2010 and the BBC Trust finance committee[1] approved it on 24 June 2010. Both received quarterly reports prepared by the BBC's project management office on the performance of the BBC's major programmes and projects, including the DMI. The BBC direction group received ad hoc briefings from the DMI programme leadership team.[2]

**1.6**    The BBC told us that executive-level responsibility for the DMI ultimately resided with the executive director who led the BBC's technology operations. We understand from the BBC that when the business case for the DMI was approved by the BBC Trust in June 2010, the director of future media and technology was responsible. The BBC transferred executive-level responsibility for technology to its chief operating officer in March 2011 following a reorganisation. It transferred responsibility again in September 2012, to its chief financial officer, following another reorganisation.

**1.7**    For a programme of the DMI's size, we would have expected the BBC to appoint a senior responsible owner to take responsibility for meeting programme objectives, achieving benefits and ensuring system development and business requirements were aligned. However, the BBC split responsibility for the DMI between divisions. Future media and technology was responsible for developing the investment case, delivering the system and achieving its share of the projected benefits. The divisions that would use the DMI were responsible for deploying the system and ensuring that it generated the projected benefits in their areas after it had been built.

**1.8**    The DMI steering group was responsible for overseeing the Programme. It was chaired by the chief technology officer, whose line manager was the director of future media and technology (until March 2011, when the chief operating officer took over executive-level responsibility for technology). The other members of the DMI steering group were senior representatives from future media and technology, and the intended users of the new system. The BBC's chief financial officer had a place on the DMI steering group from May 2010 but in practice a member of her team attended meetings on her behalf. No other executive director had a place on the steering group.

**1.9**    The business case for the DMI stated that the DMI programme director was responsible for delivering the DMI and the chief technology officer, as chair of the DMI steering board, was accountable. However, it also stated that benefits realisation in BBC divisions was the responsibility of the users of the system, subject to it being delivered to time and acceptable quality, although the latter was not defined. As such, in our view there was no clear accountability for reconciling technical and user issues.

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1    The Trust finance committee succeeded the Trust finance and compliance committee. It had the same role in relation to the DMI and in this memorandum we use 'Trust finance committee' to refer to both.

2    PwC, *BBC Digital Media Initiative: Review of the BBC's management of the DMI*, December 2013

**Figure 2**

DMI roles and responsibilities at June 2010

**The BBC Trust finance committee, the BBC executive board and the BBC finance committee approved the business case**

**BBC Trust finance committee**

Approved the business case for the DMI. Met monthly, received the project management office quarterly update on the portfolio of critical projects. Four members (trustees). Chaired by Anthony Fry

**BBC executive board**

Approved the business case. Responsible for operational management of the BBC according to plans agreed with the BBC Trust. Met monthly, received the project management office quarterly update on the portfolio of critical projects. Sixteen members (comprising ten executive directors and 6 non-executive directors). Chaired by Mark Thompson

**BBC finance committee**

Approved the business case and responsible for monitoring spend. Met quarterly, received management information from the DMI programme and the project management office quarterly update on the portfolio of critical projects. Ten members. Chaired by Zarin Patel

**BBC direction group**

Responsible for pan- BBC issues delegated to it from the executive board. Twenty-two members (comprising executive and divisional directors). Met monthly. Chaired by Mark Thompson

**BBC Project Management Office (PMO)**

Received quarterly management information from the DMI approved by the chief technology officer and the programme director.

Forms an assessment of the status of the DMI and produced a consolidated quarterly report on the whole BBC portfolio of critical projects including the DMI

**BBC vision (on behalf of user divisions)**

Co-sponsor of the DMI (applying the programme and generating financial and non-financial benefits)

**Future media and technology**

Responsible for developing the investment case, securing investment approval from the BBC executive and the BBC trust, delivering DMI and achieving the benefits from DMI within its division

**DMI steering group**

Responsible for guiding the DMI to deliver the outcomes and vision in the business case. Chaired by the chief technology officer, with other members comprising senior managers from future, media and technology and user divisions. Met monthly

**DMI programme leadership team**

Responsible for implementing the DMI programme. Headed by the programme director

→ Formal reporting    ---▶ Informal reporting    → Accountability for DMI

Source: National Audit Office based on internal DMI programme documents supplied by the BBC

**1.10** Key roles in the DMI programme leadership team, including the programme director and technical director, underwent several changes in staffing over a relatively short period (**Figure 3**). In addition to creating a lack of continuity in knowledge of the programme, high turnover in key roles can result in changing focus and priorities, which can cause delays.

**Figure 3**
Staffing changes

**Discontinuity in key programme roles**
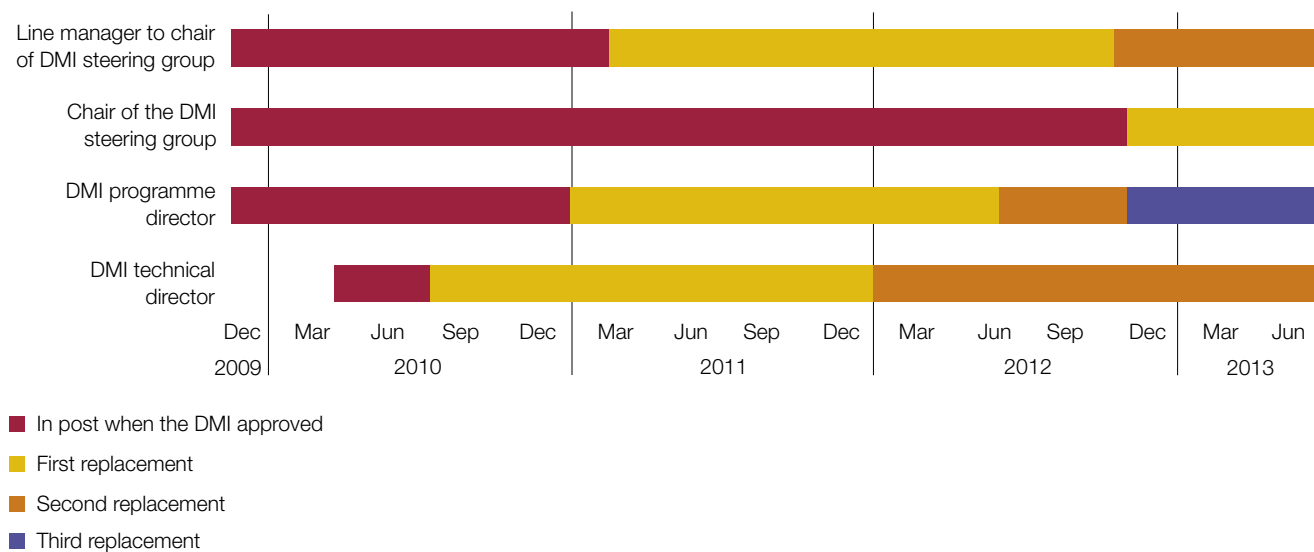


- ■ In post when the DMI approved
- ■ First replacement
- ■ Second replacement
- ■ Third replacement

Source: Adapted from PwC, *BBC Digital Media Initiative: Review of the BBC's management of the DMI*, December 2013

# Part Two

## Chronology of events

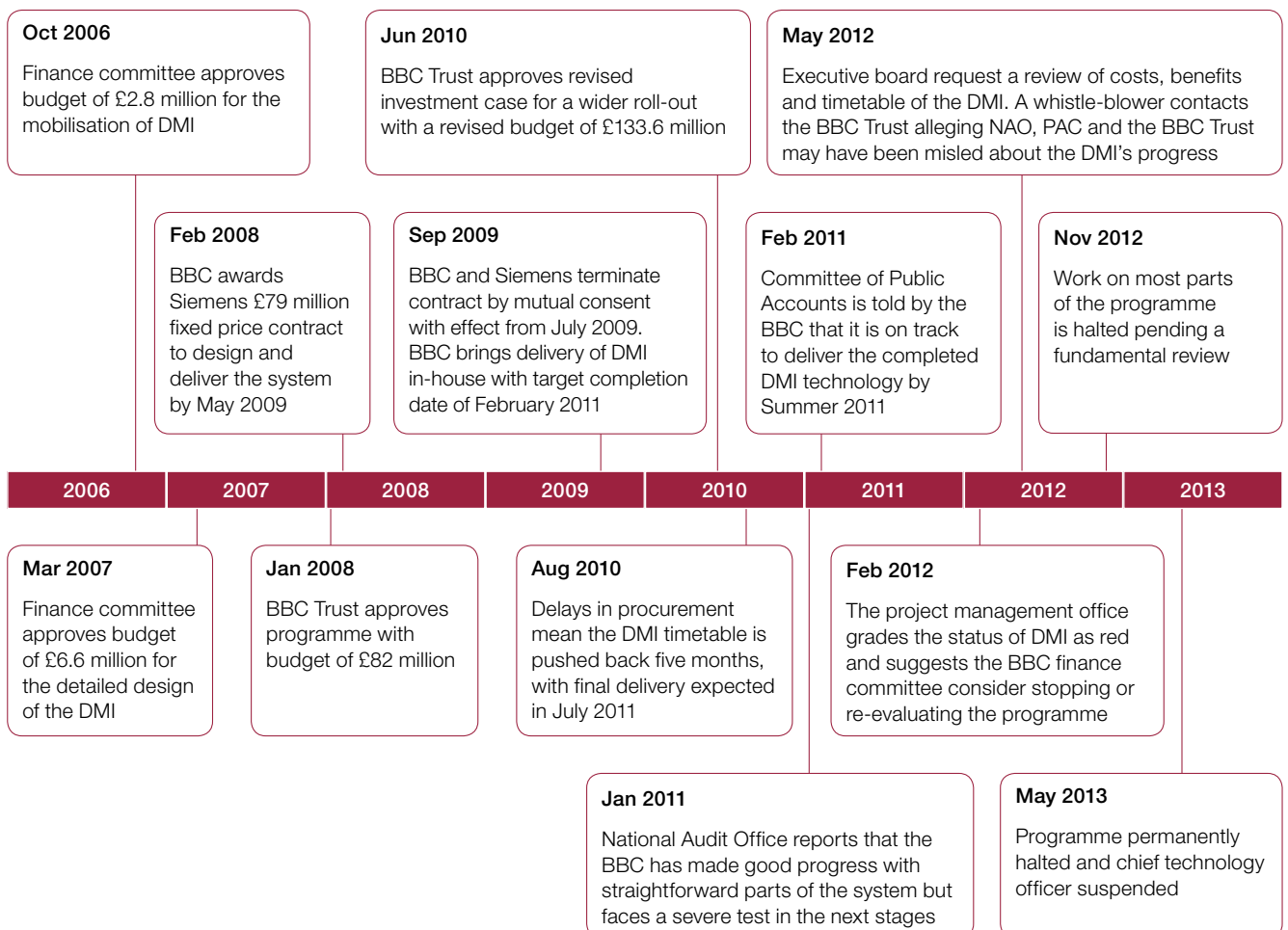**2.1** This part summarises the Programme's status when we reported in January 2011 and subsequent developments that culminated in the BBC deciding to cancel the Programme. **Figure 4** summarises the main events over the Programme's life.

**Figure 4**
Summary of events

The BBC established the Programme in October 2006 and cancelled it in May 2013

**Oct 2006**
Finance committee approves budget of £2.8 million for the mobilisation of DMI

**Jun 2010**
BBC Trust approves revised investment case for a wider roll-out with a revised budget of £133.6 million

**May 2012**
Executive board request a review of costs, benefits and timetable of the DMI. A whistle-blower contacts the BBC Trust alleging NAO, PAC and the BBC Trust may have been misled about the DMI's progress

**Feb 2008**
BBC awards Siemens £79 million fixed price contract to design and deliver the system by May 2009

**Sep 2009**
BBC and Siemens terminate contract by mutual consent with effect from July 2009. BBC brings delivery of DMI in-house with target completion date of February 2011

**Feb 2011**
Committee of Public Accounts is told by the BBC that it is on track to deliver the completed DMI technology by Summer 2011

**Nov 2012**
Work on most parts of the programme is halted pending a fundamental review

| 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------|------|------|------|------|------|------|------|

**Mar 2007**
Finance committee approves budget of £6.6 million for the detailed design of the DMI

**Jan 2008**
BBC Trust approves programme with budget of £82 million

**Aug 2010**
Delays in procurement mean the DMI timetable is pushed back five months, with final delivery expected in July 2011

**Feb 2012**
The project management office grades the status of DMI as red and suggests the BBC finance committee consider stopping or re-evaluating the programme

**Jan 2011**
National Audit Office reports that the BBC has made good progress with straightforward parts of the system but faces a severe test in the next stages

**May 2013**
Programme permanently halted and chief technology officer suspended

Source: National Audit Office based on various published and unpublished sources provided

## DMI's previous status

**2.2** We examined the DMI's status at December 2010 and reported our findings to the BBC Trust in January 2011.[3] Our findings were based on our review of investment cases, programme documentation, interviews with key stakeholders in the programme and a high-level review that the consultancy firm Amtec undertook for us of the programme's status and the risks it faced. We reported that:

- The BBC had appointed Siemens in February 2008 to build the system and had set a target completion date of May 2009. However, forecast completion dates fell behind schedule and the BBC took the programme in-house in September 2009 after agreeing a no-fault termination settlement with Siemens with effect from July 2009. The BBC did not assess the risks and value for money of alternatives to in-house delivery or revisit an earlier assessment it made in February 2009 that this would be the highest risk option. The BBC considered that it could develop its capability by recruiting staff with relevant expertise or using third-party suppliers to build system components that the BBC would then integrate. When it took the system in-house, the BBC had spent 18 months on development without securing a working system. The BBC estimated that the DMI would not be ready until February 2011, a delay of 21 months.

- By August 2010, the BBC found that its schedule would be delayed by a further five months to July 2011. The BBC had implemented two of the six technology releases (**Figure 5**), the second of these comprising three sub-releases. In June 2010, BBC-commissioned consultants reported that users had been positive about the elements of the system the BBC had implemented. The consultants said that although there were several important issues to address, such as poor planning, there had been an improvement in stakeholder engagement and a positive reaction to the components completed. However, the BBC had completed only the most straightforward elements of the system. Completing the more complex future stages would be a severe test of the BBC's approach. We recommended that the BBC should draw up more detailed plans specifying resource requirements and responsibilities for each team to avoid confusion about releases or poor visibility of progress.

- The BBC had not obtained an independent technical assessment. It is standard practice in technology projects to seek independent assurance to ensure that technical designs can be implemented. We reported that the technology solution had so far proven to be valid. However, planning processes to develop and test the system were not sufficiently rigorous to support the more complex integration of the system elements.
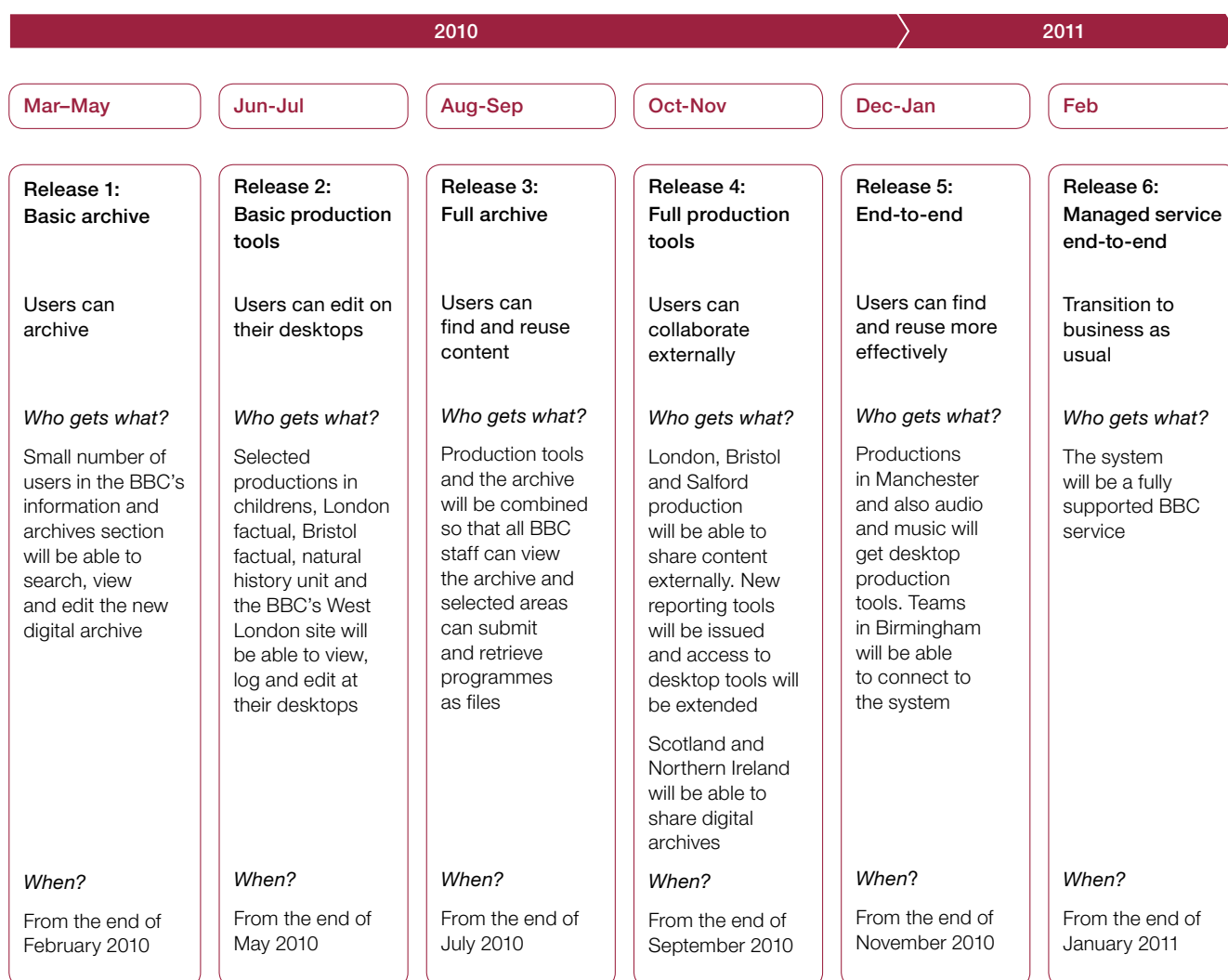
3    Comptroller and Auditor General, *The BBC's Management of its Digital Media Initiative:* Report presented to the BBC Trust's Finance and Compliance Committee 13 January 2011. Presented to Parliament by the Secretary of State for Culture, Media & Sport, February 2011.

- To develop the system, the BBC relied heavily on third-party products but until October 2010, it did not have a full-time supplier management lead in post. We also found that for several third-party suppliers, the BBC's programme plan only gave a date for agreeing a specification and a date for the final technology release from the supplier. BBC-commissioned consultants had emphasised previously, in January 2010, the importance of the BBC strengthening its supplier management for the DMI.

## Figure 5

BBC's description of technology releases at February 2010

**The BBC planned to issue six technology releases from February 2010 to February 2011 that added progressively more sophisticated capabilities**

| 2010 | | | | | 2011 |
|---|---|---|---|---|---|
| **Mar–May** | **Jun-Jul** | **Aug-Sep** | **Oct-Nov** | **Dec-Jan** | **Feb** |
| Release 1: Basic archive | Release 2: Basic production tools | Release 3: Full archive | Release 4: Full production tools | Release 5: End-to-end | Release 6: Managed service end-to-end |
| Users can archive | Users can edit on their desktops | Users can find and reuse content | Users can collaborate externally | Users can find and reuse more effectively | Transition to business as usual |
| *Who gets what?* | *Who gets what?* | *Who gets what?* | *Who gets what?* | *Who gets what?* | *Who gets what?* |
| Small number of users in the BBC's information and archives section will be able to search, view and edit the new digital archive | Selected productions in childrens, London factual, Bristol factual, natural history unit and the BBC's West London site will be able to view, log and edit at their desktops | Production tools and the archive will be combined so that all BBC staff can view the archive and selected areas can submit and retrieve programmes as files | London, Bristol and Salford production will be able to share content externally. New reporting tools will be issued and access to desktop tools will be extended

Scotland and Northern Ireland will be able to share digital archives | Productions in Manchester and also audio and music will get desktop production tools. Teams in Birmingham will be able to connect to the system | The system will be a fully supported BBC service |
| *When?* | *When?* | *When?* | *When?* | *When*? | *When?* |
| From the end of February 2010 | From the end of May 2010 | From the end of July 2010 | From the end of September 2010 | From the end of November 2010 | From the end of January 2011 |

Source: National Audit Office based on internal DMI programme documents supplied by the BBC

- The BBC's projection of financial benefits for the DMI had weakened over time. In January 2008, the BBC estimated that the DMI would generate net financial benefits of £17.9 million by March 2015. However, its latest forecast when we reported was that the DMI would represent a net cost to the BBC up to March 2017 of £38.2 million, or £10.7 million after including the financial package it agreed with Siemens (paragraph 3.3). We therefore recommended that the BBC should resubmit programmes for approval where the delivery model, risk profile or cost–benefit projection changes.

**2.3** We concluded that although the BBC had started to implement the system, there was still a considerable way to go to develop a technically complex system. It required integrating several interdependent elements without any time contingency. In addition, the DMI's success depended on take-up by users across the BBC and elsewhere.

**2.4** The BBC's timetable involved high levels of concurrent activity and important dependencies, including supporting its move to Salford. Its initial focus after bringing the DMI in-house was on issuing technology releases to demonstrate progress and rebuild users' confidence. The BBC had made progress when we reported. However, having no clear baseline and then changing the scope of individual technology releases, made it difficult to compare what had been completed with what had been planned. For example, the DMI programme team's plans for the DMI did not match its release schedules. BBC-commissioned programme management consultants had reported in January 2010 that plans for the DMI were superficial. The consultants also concluded that the BBC needed to be clearer about the scope of technology releases and the exact split of accountabilities across the programme management team. The BBC had also still to establish detailed business requirements for the DMI.

**2.5** The BBC's internal reporting showed that it completed release 1 (the basic archive) in February 2010. Its high-level release schedule stated that this release would allow a small number of users to use the new digital archive (Figure 5). However, release 1 was only a demonstration version that did not include a live digital archive. The DMI programme team also repeatedly changed its release strategy and timetable. For example, it split release 2 (basic production tools) into three parts. It issued the first part in June 2010 and the last in December 2010 (**Figure 6**). The BBC planned to pilot basic production tools in five production areas. However, we understand from the BBC that while there was some testing of basic production tools, they were only used in the production of one broadcast programme called 'Bang goes the theory'.

**2.6** We reported in January 2011 that the BBC had not commissioned an independent technical assessment of the system design when it appointed Siemens or when it brought the DMI in-house. However, we noted that the BBC had decided to commission a technical assessment in September 2010. The assessment, which was carried out by Accenture, was not available to us at the time of our report. The assessment submitted to the BBC in draft in December 2010 found that the system infrastructure for the DMI was not sufficiently robust to use for producing television content and that significant remedial work was required. The findings only covered part of the system as the BBC limited the assessment to two specific areas of the DMI. These were platform configuration and deployment standards, and infrastructure design support and technical assurances for releases 2.2 and 2.3.

**Figure 6**

BBC internal reporting on planned versus actual progress of the DMI at December 2010

**By December 2010, the BBC had completed four releases, of which three were sub-releases issued following delays in completing the planned scope of release 2**



● Planned release schedule

● Actual release schedule
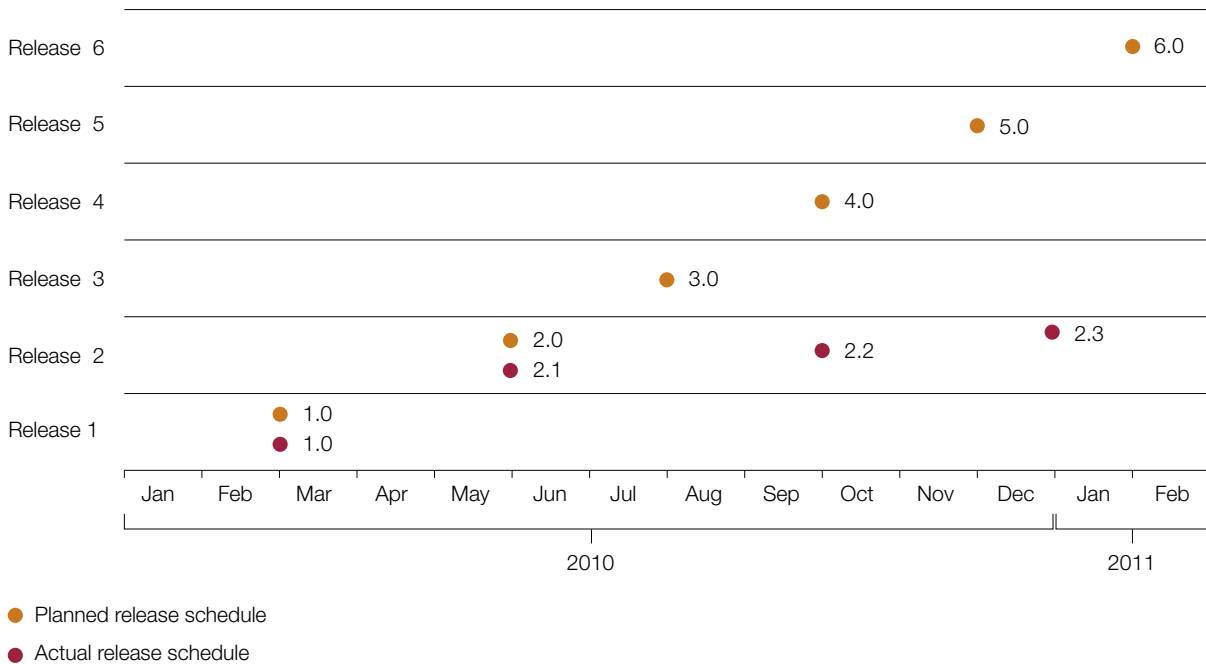
Source: National Audit Office based on a review for us in 2010 by the consulting firm Amtec

## Developments after our previous report

**2.7**    Between February and March 2011, there was a shift in the DMI steering group's expectations of the timetable for completion. The minutes of its February 2011 meetings indicate that it considered that the DMI was on track. However, by the end of March 2011, it had concluded that the technology for the DMI could not be completed until October 2011 at the earliest. Contributing factors included delays in buying components and software defects that required rework. The delay contributed to a 12 per cent reduction in the estimated financial benefits from £97.9 million in the business case approved in June 2010 to £86.6 million by the end of June 2011. The BBC's finance committee requested a benefits review in June 2011. However, BBC internal audit reported around one year later, in July 2012, that the programme team had not produced a benefits review owing to other priorities.

**2.8** The BBC's finance committee, executive board and Trust finance committee received quarterly reports prepared by the BBC's project management office. These summarised the progress and risk rating of the DMI and the BBC's other major programmes and projects. In July 2011, the project management office increased the DMI's risk rating for the period April to June 2011 from amber to amber-red. However, the reporting timetable meant that this was not presented to the BBC executive board or the BBC Trust's finance committee until September 2011 (**Figure 7**).

## Figure 7
Quarterly changes in the DMI risk rating reported by the project management office to the BBC executive board and the BBC Trust finance committee

**The BBC's executive board and the Trust finance committee did not receive timely information on increases to the Programme's risk rating**

| Date | Risk rating | Number of days after quarter end the executive board received the report | Number of days after quarter end the Trust finance committee received the report |
| --- | --- | --- | --- |
| Jan to Mar 2010 | Amber | 75 | 99 |
| Apr to Jun 2010 | Amber | 75 | 99 |
| Jul to Sep 2010 | Amber | 67 | 105 |
| Oct to Dec 2010 | Amber | 66 | 97 |
| Jan to Mar 2011 | Amber | 74 | 98 |
| Apr to Jun 2011 | Amber–Red | 74 | 70 |
| Jul to Sep 2011 | Amber–Red | 66 | 62 |
| Oct to Dec 2011 | Red | Not received | Not received |
| Jan to Mar 2012 | Red | 72 | 96 |
| Apr to Jun 2012 | Red | 72 | 96 |
| Jul to Sep 2012 | Red | 43 | 67 |
| Oct to Dec 2012 | Red | 70 | 65 |
| Jan to Mar 2013 | Red | 43 | 76 |

**Note**

1    Reporting to the BBC Trust finance committee defined 'red' as involving issues which may not be resolvable or manageable but did not define 'amber-red'. Reporting by the DMI programme defined red as meaning successful delivery outcomes appeared to be unachievable, with major issues that did not appear to be manageable or resolvable. It defined 'amber-red' as where successful delivery was in doubt with major risks or issues apparent in a number of key areas.

Source: Adapted from PwC, *BBC Digital Media Initiative: Review of the BBC's management of the DMI*. December 2013

**2.9** The minutes of the executive board and the BBC Trust's finance committee do not record any discussion of the increased risk rating. The BBC Trust finance committee did, however, question the executive about whether slippages in achieving milestones for the DMI and the move to Salford might lead to the possibility of reduced benefits. However, it took assurance that there was potential for unforeseen benefits. The BBC's project management office subsequently increased the risk rating to red for the period October to December 2011, in February 2012. This was reported to the finance committee in February 2012. However, it was not reported to the executive board until June 2012 or to the BBC Trust finance committee until July 2012.

**2.10** Progress deteriorated further during 2011 and the first part of 2012, with delays, technology defects and a widening gap between what the DMI offered and what users expected. The delays also resulted in completion dates being pushed beyond the required dates for the BBC relocating to Salford, which the BBC had identified as a critical deadline.

● In September 2011, BBC sport, which was based at Salford, bought an off-the-shelf digital storage system at a cost of £800,000 in response to the non-availability of the DMI. Some other production teams that relocated to Salford also subsequently installed digital storage and adapted their editing technology to operate as stand-alone systems as an alternative to the DMI. The BBC identified the avoided cost of creating local systems as an important benefit of the DMI. The development of alternative systems started to erode the case for the DMI.

● PwC in its review for the BBC Trust reported that by November 2011 it had become apparent to the DMI programme team and the Salford team that a critical milestone for implementing the DMI at Salford could no longer be met.

● In February 2012, confidence in completing the system and achieving benefits had deteriorated to the extent that the BBC's project management office suggested that the BBC's finance committee might consider stopping, re-evaluating and redirecting the programme. However, the finance committee concluded that the DMI could be completed and approved the programme to continue.

● Following a major technical setback at the end of April 2012 that prevented the roll-out of the DMI at Salford, the BBC's chief technology officer sent a report summarising the issues to its chief operating officer and chief financial officer.

**2.11** On 14 May 2012, the BBC's executive board asked the chief operating officer to give an update on the DMI before the summer. This update reported that most system components were still incomplete. Later that month, the director of BBC vision, an important prospective user of the DMI, raised concerns about the DMI's progress. Around this time, a former BBC employee contacted the Trust raising concerns about the DMI programme and how far the progress that we reported in 2011 had been achieved.

**2.12** In July 2012, the BBC informed the BBC Trust finance committee that the DMI was significantly behind schedule and its risk rating had increased to red. The BBC agreed to report back to the Trust after it had completed a review of costs, timetable and projected benefits. In the same month, BBC internal audit reported to the BBC's executive audit committee on a review of the DMI governance and planning. This review had been postponed from 2011 to minimise the audit burden on the DMI team. It was the first audit or assurance review of the DMI since the January 2011 report (**Figure 8**). Internal Audit found that:

- The programme team had not updated the DMI business case that the BBC Trust had approved in April 2010, despite the significant changes to the timetable and projected benefits. This meant it was not possible to assess whether the DMI was viable and achievable.

- The BBC had not embedded independent assurance within the DMI's governance structure.

- The BBC had not set out the required end state for the system or developed detailed user requirements and acceptance criteria until a late stage in the process. It also did not have an agreed approach to quality assurance.

**2.13** The following month, a high-level internal review reported, in August 2012, that although the purpose of the archive was understood, DMI requirements remained vague and production teams were indifferent about using production tools. The DMI subsequently noted, in October 2012, that although production tools were potentially viable, they had still to be proven and the intended users had recommended stopping further development owing to unclear business direction. The steering group decided that the programme team should finish work on production tools, in November 2012, so that the BBC would have the option to use them in the future.
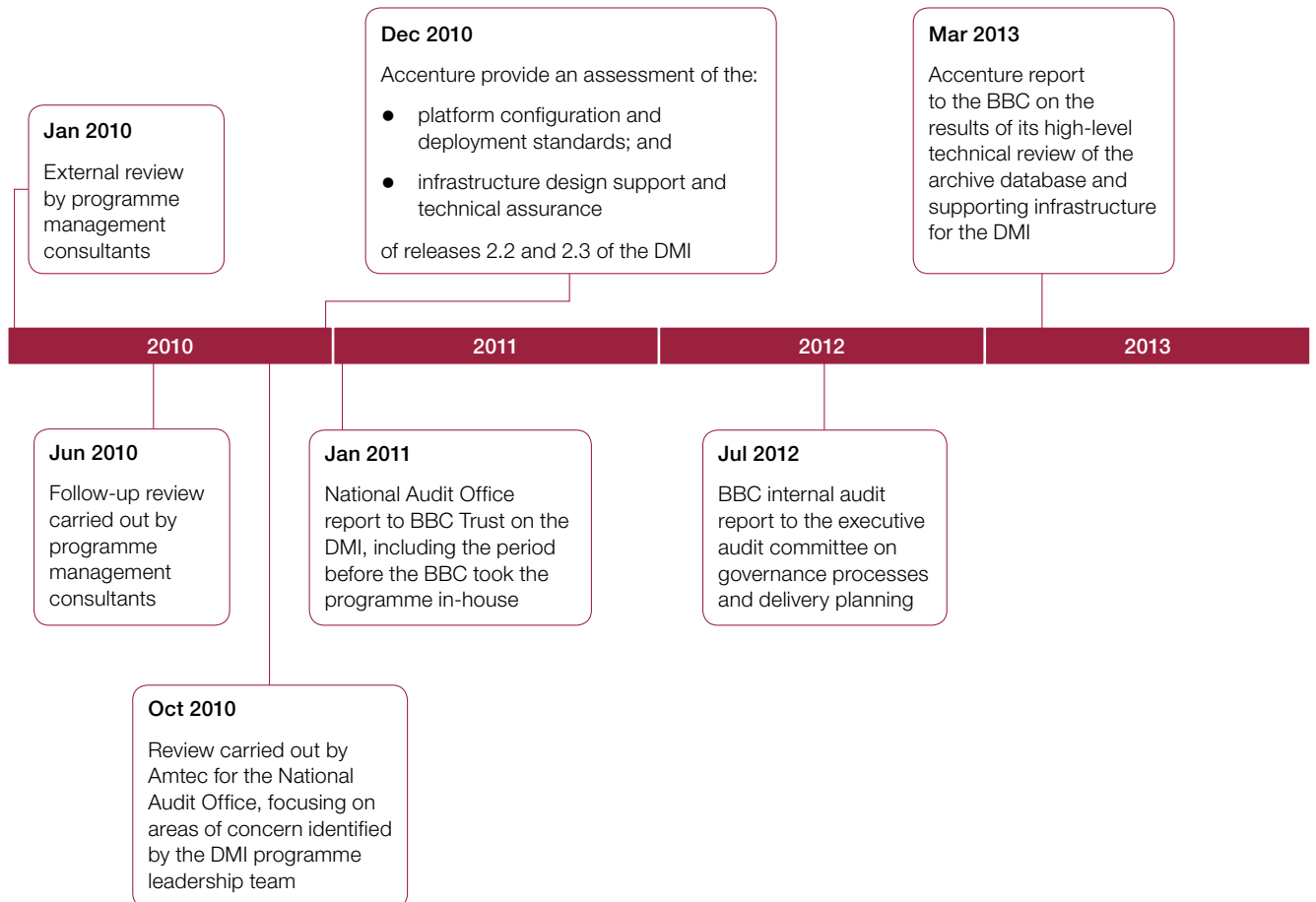
**2.14** After completing its initial review of the timetable, costs and benefits, the executive board decided in October 2012 to halt work on most parts of the programme and prepare a revised business case in line with requests from the BBC Trust. The BBC Trust informed the Committee of Public Accounts in November 2012 that the DMI had fallen significantly behind schedule and that the BBC was preparing a revised investment case.

**2.15** The BBC continued to review its future needs and what the DMI programme had delivered. As part of this work it commissioned a technical review from Accenture. Accenture carried out its review over a five-week period in January and February 2013. It examined the development of the archive database and supporting infrastructure. The production tools developed by the DMI programme team were outside the scope of Accenture's review as the BBC had halted further development owing to unclear business direction. Accenture reviewed the system requirements and software design documentation but did not carry out a detailed audit of the DMI or perform any systems testing.

**Figure 8**

Audit and assurance timeline

**Between January 2011 and July 2012, the DMI was not subject to any audit or assurance reviews**

**Jan 2010**

External review by programme management consultants

**Dec 2010**

Accenture provide an assessment of the:

● platform configuration and deployment standards; and

● infrastructure design support and technical assurance

of releases 2.2 and 2.3 of the DMI

**Mar 2013**

Accenture report to the BBC on the results of its high-level technical review of the archive database and supporting infrastructure for the DMI

| 2010 | 2011 | 2012 | 2013 |
|------|------|------|------|

**Jun 2010**

Follow-up review carried out by programme management consultants

**Jan 2011**

National Audit Office report to BBC Trust on the DMI, including the period before the BBC took the programme in-house

**Jul 2012**

BBC internal audit report to the executive audit committee on governance processes and delivery planning

**Oct 2010**

Review carried out by Amtec for the National Audit Office, focusing on areas of concern identified by the DMI programme leadership team

Source: National Audit Office based on PwC, *BBC Digital Media Initiative: Review of the BBC's management of the DMI*, December 2013, and internal DMI programme documents provided by the BBC

**2.16** Accenture's findings included the following:

- The programme had not kept pace with changing business priorities and programme governance was not robust.

- There was evident confusion within the BBC about the use of key terms such as 'archive database' and 'digital archive'.

- DMI software that was used for the archive database was also designed to support production tools. The BBC's decision not to implement production tools meant that the software architecture for the archive database was overly-complex for a physical stock and loan system.

- There had been insufficient testing of DMI components.

Accenture advised that more work would be required to complete the digital archive and test whether it was fit for purpose. The BBC has carried out this testing.

**2.17** After completing its review, the BBC concluded in May 2013 that its original vision for integrated production tools was no longer valid and that it needed to revise its approach to developing a BBC-wide digital archive. It therefore decided to maintain the archive database but close the rest of the DMI programme. It wrote down the value of assets to £0 because it considered that the programme had failed to achieve its objectives. When the BBC cancelled the programme, with the approval of the BBC Trust, it did not have a technical assessment of whether the system could be completed or the cost of doing so. When the executive board cancelled the DMI, it identified a failure to recognise the severity of the issues in reports it had received. It also noted the need to ensure appropriate governance and clear accountability for delivery for programmes like the DMI.

**2.18** The chairman of the BBC Trust finance committee wrote to the chair of the Committee of Public Accounts explaining why the BBC had closed the Programme. The main reason was that much of the software and hardware that the BBC had developed could only be used if the whole project were completed. The BBC and the Trust concluded that owing to technological difficulties and changes to business needs, this would be throwing good money after bad.

**2.19** In May 2013, the BBC Trust also commissioned a report on the DMI from PwC with a focus on project governance and reporting. PwC found that DMI reporting focused on technology risks and issues rather than whether the programme could achieve operational change to business practices in the BBC. PwC also found that the DMI did not provide clear and transparent reporting on progress against the plan, cost to complete, or delivery of benefits to enable effective decision-making. PwC concluded that the BBC executive's view of progress could have been more clearly informed by taking into account reporting by projects that depended on the DMI, such as the move to Salford, on the impact of delays on delivering the system. In December 2013, following a review of governance arrangements across the BBC, the BBC announced a new approach to project reporting to speed it up and identify issues earlier.

# Part Three

## Costs, residual benefits and plans

**3.1** This part summarises:

● where the £125.9 million (gross) the BBC spent on the DMI went;

● what the BBC got in return; and

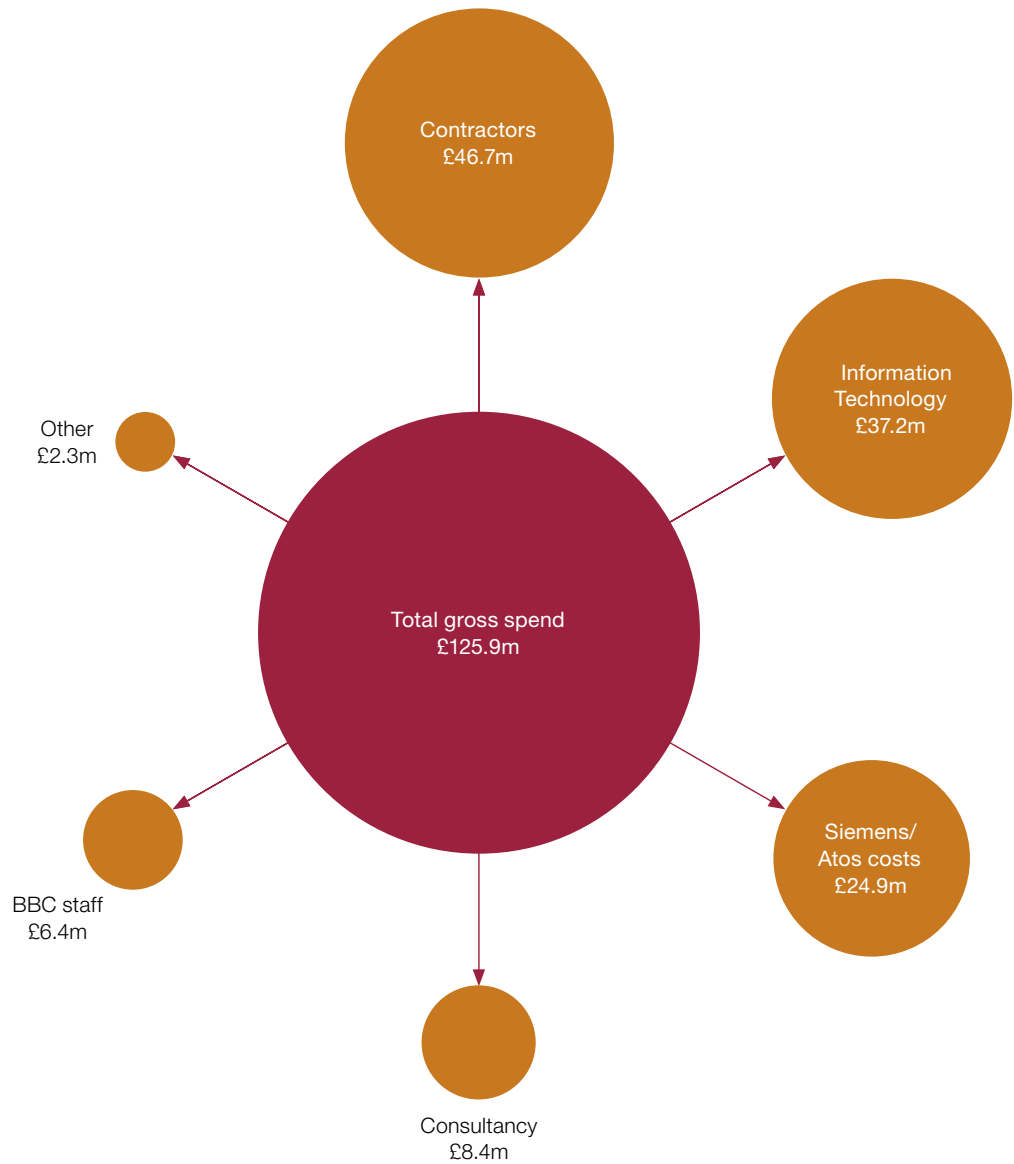● the BBC's plans for digital production and archiving.

### Where the money went

**3.2** The BBC spent £125.9 million (gross) on the DMI from April 2007 to September 2013 against an approved budget of £133.6 million to March 2017 (**Figure 9** overleaf). Spend on staff, contractors and consultants accounted for nearly half of the final cost of the DMI.

**3.3** As part of its negotiations with Siemens before it brought the DMI in-house, the BBC secured a termination settlement from Siemens worth £27.5 million. This comprised service credits of £24.5 million, asset transfers valued at the point of transfer at £2.2 million and a cash payment of £0.8 million. The BBC told us that it had received all of these in full, which it had recorded in a summary spreadsheet of payments that it had received. The BBC offset these transfers against DMI costs to give a net cost of £98.4 million.

**Figure 9**

Where the money went

**Contractors, consultancy and BBC staff accounted for nearly half of the final cost of the DMI**

Contractors
£46.7m

Information
Technology
£37.2m

Other
£2.3m

Total gross spend
£125.9m

Siemens/
Atos costs
£24.9m

BBC staff
£6.4m

Consultancy
£8.4m

**Note**

1    Atos acquired Siemens IT Solutions and Services in 2011.

Source: National Audit Office using management information supplied by the BBC

**3.4** The DMI programme used a combination of BBC staff, contractors and staff from third parties and consultants (**Figure 10**). At its peak, the BBC programme team had 184 contractors and BBC staff.

## Figure 10
People working on DMI, January 2010 to September 2013

**The number of people working on the DMI peaked in June 2011**

Headcount



— Total DMI headcount

— Contractors
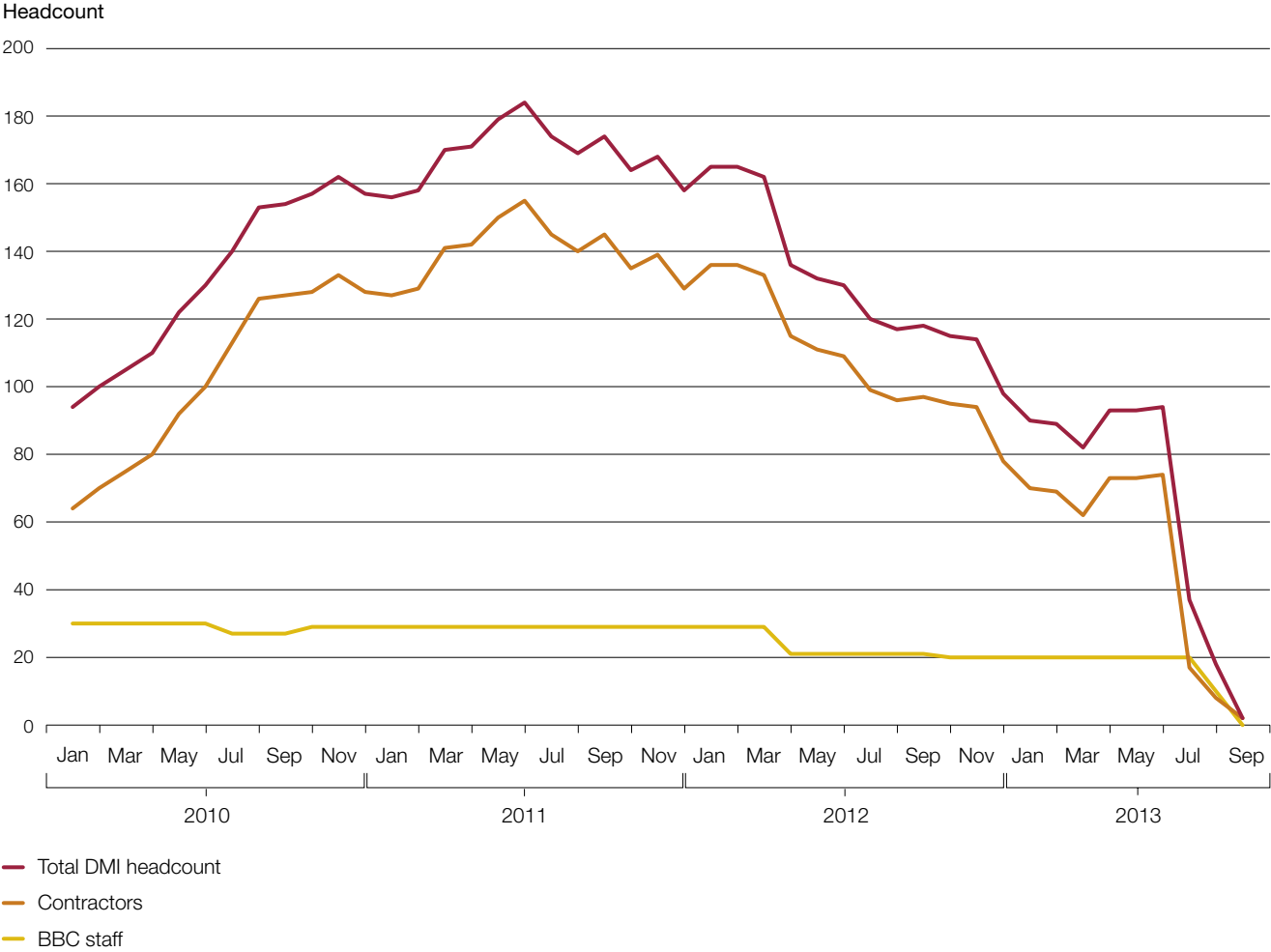
— BBC staff

**Note**

1    Excludes consultants as figures were not available. Figures for BBC staff are approximate.

Source: National Audit Office based on BBC data

## Programme outputs and benefits

**3.5** **Figure 11** summarises the status of each DMI component when the BBC closed the programme. The BBC intends to redeploy some components but wrote their value down to £0 in its 2012-13 financial statements as it had not yet determined their future use.

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**Figure 11**
BBC's assessment of what the DMI achieved

Only the archive database and some enterprise services were in live use when the BBC cancelled the DMI

| Component | Description | In use? | Status |
| --- | --- | --- | --- |
| Archive database | A database to catalogue and manage archives held on tape and other physical media as well as digital content. | Partially | The BBC released the first version in June 2012 and worked from June 2012 to September 2013 to fix high-priority defects and meet minimum requirements. It issued a final release in September 2013, which is being used for physical but not digital archives. |
| Digital archive | A virtual warehouse for storing digital audio and video content that would be integrated with the archive database. The BBC considered that it would remove the need for storing programmes on tapes. | No | The BBC suspended further work on the digital archive in October 2012 while it finished its DMI review. The BBC did not finish developing the digital archive. |
| Production tools | Fully-featured digital production and collaboration software that would allow BBC staff and external users to get, edit and share footage. It would be integrated with the archive database. | No | The BBC suspended further work on production tools in December 2012. By this stage, production teams were using off-the-shelf software and did not trial the final version of production tools. |
| Production reporting | A replacement system for logging production information about uncut footage and final programmes that would be integrated with other DMI components. | No | The BBC did not complete the development of this component. The BBC has not yet decided whether it will use this tool in the future. |
| Music reporting system | Replacement for a legacy system that was a minor part of DMI's scope. | Yes | The BBC deployed this component. |
| Media infrastructure | A system to allow files to be moved around the BBC efficiently and securely. The specification for this infrastructure was designed to align closely with the specification for production tools. | No | The BBC has concluded that the ability to move files has been proven and is exploring whether the infrastructure can be used to develop a future digital archive. |
| Enterprise services | These services would offer reusable software services that could be used in future projects. | Partially | Individual enterprise services are at various stages of build, test and deployment. They are not being used for DMI but the BBC considers that all could provide some ongoing value to the BBC. |

Source: BBC

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**3.6** The three main assets created by the DMI were:

- an archive database that production teams can use to search and order content held on tape and other physical media in the BBC's archives;

- digital storage hardware and software; and

- other DMI components.

## Archive database

**3.7** The archive database is a cataloguing-and-ordering system for content held on tape and other physical media in the BBC's archives. By March 2013, the system had around 5,200 registered users and 640 people using it every week to order stock from the BBC's physical archives. The system, which the BBC intends to maintain for three years, had annual running costs of £5.3 million as at December 2013. The BBC estimates that it can reduce annual running costs to around £3 million by introducing new contracting arrangements. The BBC intends to switch off its legacy stock management and ordering system, which has annual running costs of £780,000, but as at December 2013 had not done so.

**3.8** Accenture reported in its technical review for the BBC that software for the archive database was overly complex as it was designed to support other parts of the DMI system, including production tools that the BBC was not using. It also found that the design of the user interface was not aligned with business processes. The BBC carried out further work to improve the database but, despite users requesting improvements to the system, it does not intend to issue any further releases.

## Digital storage hardware

**3.9** The BBC bought large data storage units for the digital archive and to allow files to be transferred around the BBC. The BBC has used them to support the archive database and other digital storage. The BBC has set up a project ('end-to-end') to determine its future technology requirements. As part of this it will assess whether it can redeploy data storage units further.

## Other DMI components

**3.10** Other DMI components include a replacement music reporting system, which holds information about the use of music in broadcasts for copyright purposes. This system was a minor element of the DMI that is used to report on the music used in BBC broadcasts. At December 2013 it had five users.

## Financial benefits

**3.11** The BBC identified three types of financial benefit totalling £97.9 million from April 2010 to March 2017 in the business case that the Trust approved in June 2010:

- Projected cost reduction of £51.2 million from increased efficiency in production areas.

- Projected cost avoidance of £29.8 million from avoiding spend on local data archives and local production tools that were not integrated across BBC divisions.

- Projected creative dividend of £17 million from reusing existing content instead of creating new content when it was not necessary.

**3.12** The BBC considers that owing to the non-delivery of the DMI, it will secure none of the financial benefits it had previously anticipated (**Figure 12**).

### Figure 12
Changes in estimated lifetime benefits

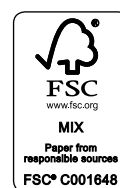**The BBC considers that its spending on the DMI will generate no financial benefits**

Comparison of planned and actual lifetime benefits from to March 2017 (£m)



- Creative dividend
- Cost reduction
- Cost avoidance
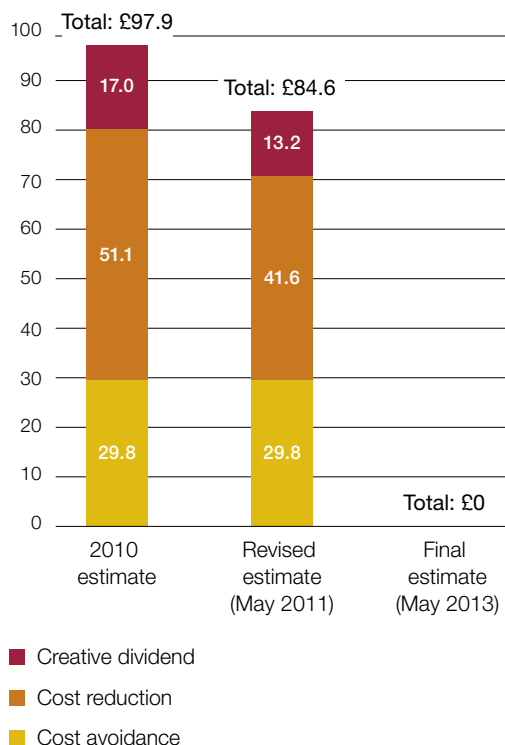
**Note**
1    All figures are expressed in cash terms.

Source: National Audit Office based on financial data provided by unpublished BBC data