Pflichtenheft „Beeld Online"

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Inhaltsverzeichnis

1. Zielbestimmungen

„Beeld Online" ist ein Online- Portal, welches es dem Benutzer ermöglicht, PDF- Dateien (im Folgenden auch „Books" genannt) zu speichern und unabhängig von Standort, verwendetem Betriebssystem und installierter Software anzusehen oder herunterzuladen.

Dies soll es ermöglichen, die Datenhaltung von PDF- Dateien über mehrere Rechner konsistent zu halten und damit benötigte Dokumente immer zur Verfügung stellen zu können.

1. Musskriterien

1. Benutzerverwaltung

Ein potentieller Benutzer muss in der Lage sein, sich an der Anwendung zu registrieren. Danach ist es dem Anwender möglich, sich am Portal an- und abzumelden, persönliche Informationen sowie sein Passwort zu ändern und seinen Account zu löschen.

2. Verwaltung der Books

Jeder User kann innerhalb von „Beeld Online" Books hochladen. Diese werden innerhalb des sogenannten „Bookshelfs" zusammengefasst. In dieser Aggregation werden - ähnlich wie in einem realen Bücherregal - die Dateien aufgelistet und können zur Ansicht ausgewählt werden. Zusätzlich kann der Shelf auch durchsucht werden; initial nur nach dem Titel der Datei.

Der Uploadmechanismus unterscheidet zwischen lokalen Dateien vom Rechner des Anwenders und Dateien von anderen Servern. Der Vorteil dieser Unterscheidung ist das Fehlen eines Zwischenschrittes im Workflow für das Portal: Der Benutzer muss Dateien nicht erst auf seinen Rechner herunterladen, bevor er sie seinem Bookshelf hinzufügt.

Jedes Book kann im Browser angezeigt werden. Hierfür wird allerdings nicht die PDF-Datei verwendet, denn dann wäre das Portal auf lokal installierte Software wie den Adobe Reader angewiesen. Um dies zu umgehen, werden die anzuzeigenden Seiten aus dem Dokument extrahiert, in ein Bitmapformat umgewandelt und dem Client zur Verfügung gestellt. Um ein flüssiges Weiterschalten der Seiten zu gewährleisten, werden folgende Seiten über einen PreLoad- Mechanismus (Laden vor dem Anzeigen) geladen.

Sollte die Funktionalität der PDF benötigt werden (z.B. Textextraktion, Volltextsuche), kann diese auch heruntergeladen werden.

Zusätzlich ist es möglich, ein Book aus dem Bookshelf zu löschen.

2.   Wunschkriterien

In folgenden Versionen von „Beeld Online" soll es möglich sein, Books mit anderen Benutzern zu teilen. Hierzu muss es möglich sein, andere Teilnehmer zu suchen, um diesen Zugriff auf ein Buch zu gewähren. Hier soll unterschieden werden, ob dieser zeitlich begrenzt oder unbegrenzt ist.

Des Weiteren sollen Metadaten für die Books gespeichert werden, um eine genauere Suche bereitzustellen. Für eBooks können beispielsweise Autor, Verlag, ISBN oder Preis gespeichert werden, um dann bei einer Suche alle PDF- Dateien eines bestimmten Verfassers oder eines Verlages anzeigen zu können. Hierzu ist es möglich, die API von Amazon zu verwenden.
Zusätzlich können Books durch eigene Tags gekennzeichnet werden.

Um die Bequemlichkeit für den Benutzer zu erhöhen, soll die Möglichkeit bestehen, Dateien per E-Mail dem Bookshelf hinzuzufügen.

Eines der wichtigsten Ziele ist jedoch, den Formatumfang der Books zu erweitern, so dass nicht nur PDF- Dateien unterstützt werden, sondern auch CHM oder verschiedene E-Book- Formate (z.B. EPUB).

3.   Abgrenzungskriterien

„Beeld Online" soll keine Sharing- Plattform wie beispielsweise Rapidshare werden; ein öffentliches Sharing wird es nicht geben. Auch wird es nicht möglich sein, Archive hochzuladen.

2. Produkteinsatz

„Beeld Online" ist in erster Linie für Endanwender gedacht - jeder kann sich registrieren und teilnehmen. Daher gibt es keine speziellen Zielgruppen oder Anwendungsbereiche.

Ein Überblick kann aber die Motivation geben, die zur Entstehung von „Beeld Online" beigetragen hat.

Im IT- Bereich gibt es eine Vielzahl verschiedener Publikationen, die kostenfrei zu Verfügung stehen. Arbeitet man an verschiedenen Rechnern, muss man entweder immer ein Speichermedium mit den benötigten Dateien mit sich führen oder die Bücher jedes Mal aufs Neue herunterladen.

Oft ist aber die Benutzung von portablen Medien in Unternehmen untersagt und die Bandbreite begrenzt, so dass die beiden oben beschriebene Möglichkeiten nicht in die Tat umzusetzen sind. Des Weiteren ist es möglich, dass ein Viewer nicht verfügbar ist und die Installation auch untersagt wird.
Hier ist die Verwendung von „Beeld Online" optimal, da man sich die Dateien direkt vom Ursprungsserver in sein Profil laden und die Datei ohne spezielle Software ansehen kann, da als Ablaufumgebung nur ein Browser benötigt wird.

3. Produktübersicht

In den folgenden Unterpunkten 1 bis 6 folgen einige Abbildungen, die die Struktur und die Arbeitsabläufe von „Beeld Online" verdeutlichen sollen.

Auf Klassendiagramme wird verzichtet, da bei Webanwendungen über das zustandslose HTTP- Protokoll keine sinnvolle und übersichtliche Struktur erstellt werden kann. Klassen werden bei jedem Aufruf einer einzelnen Seite innerhalb des Portals neu instanziiert und sind somit nicht konsistent Abzubilden.
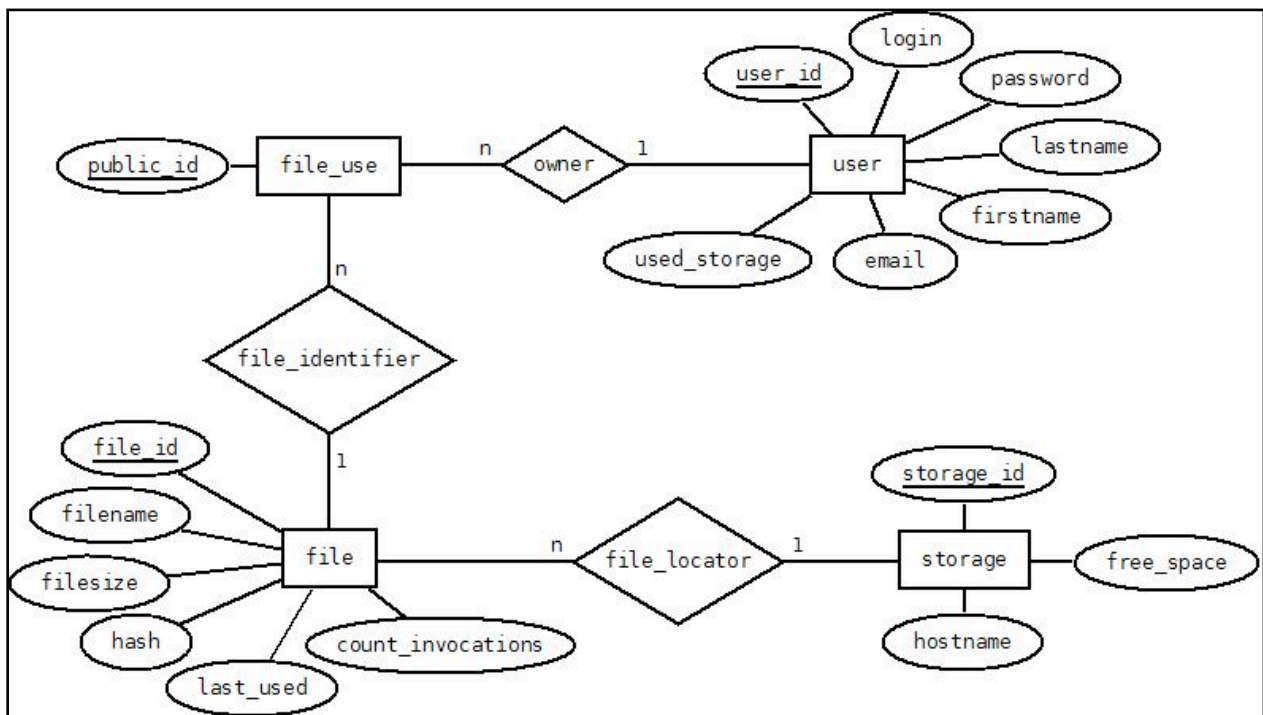
1.   Datenbankschema

Abbildung 1: Datenbankaufbau des Portals (ERD- Diagramm)

2. Schema: PDF- Verarbeitung
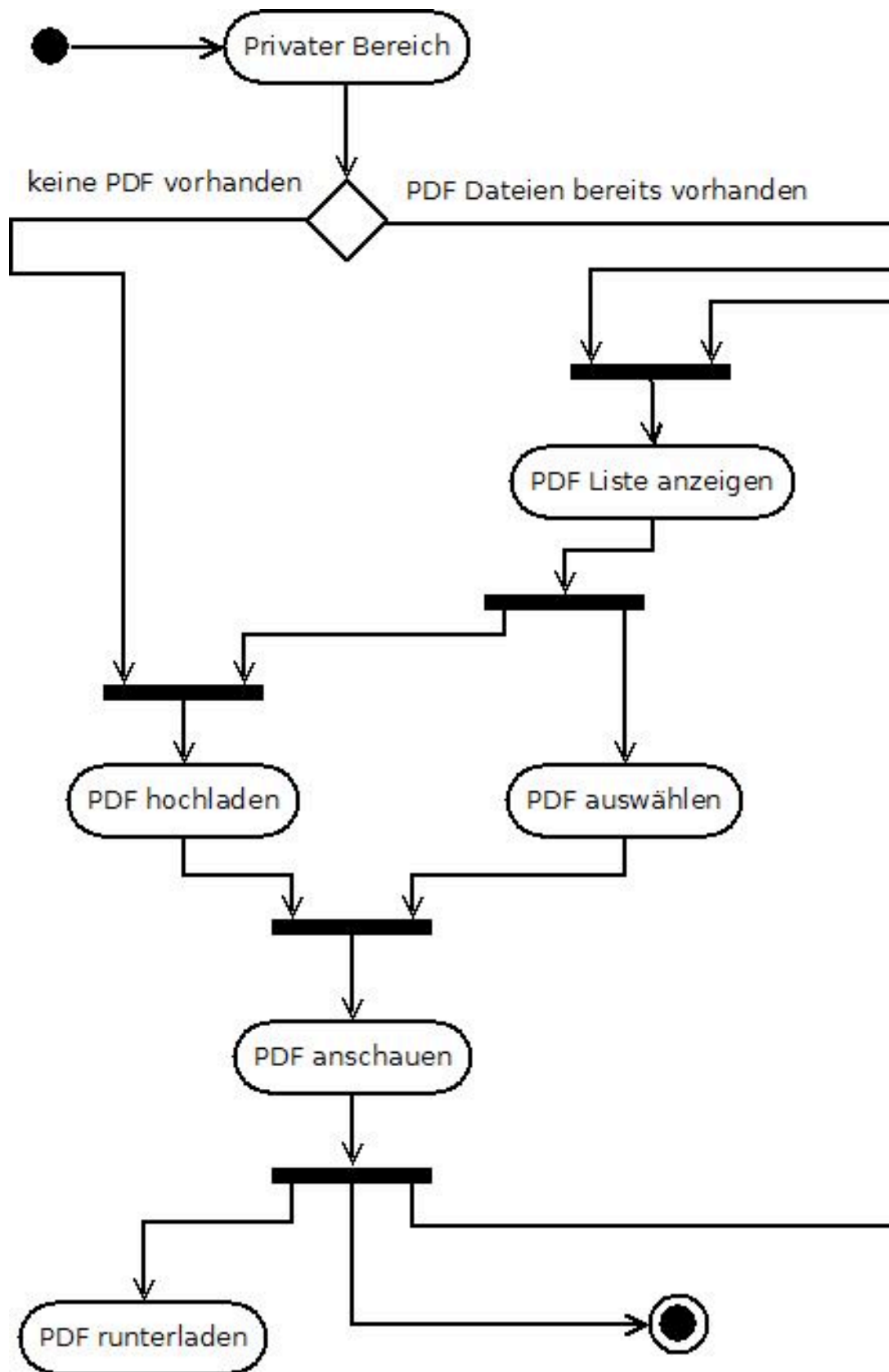
Abbildung 2: Möglichkeiten für PDF- Verarbeitung (Aktivitätsdiagramm)

3. Schema: Loginprozess
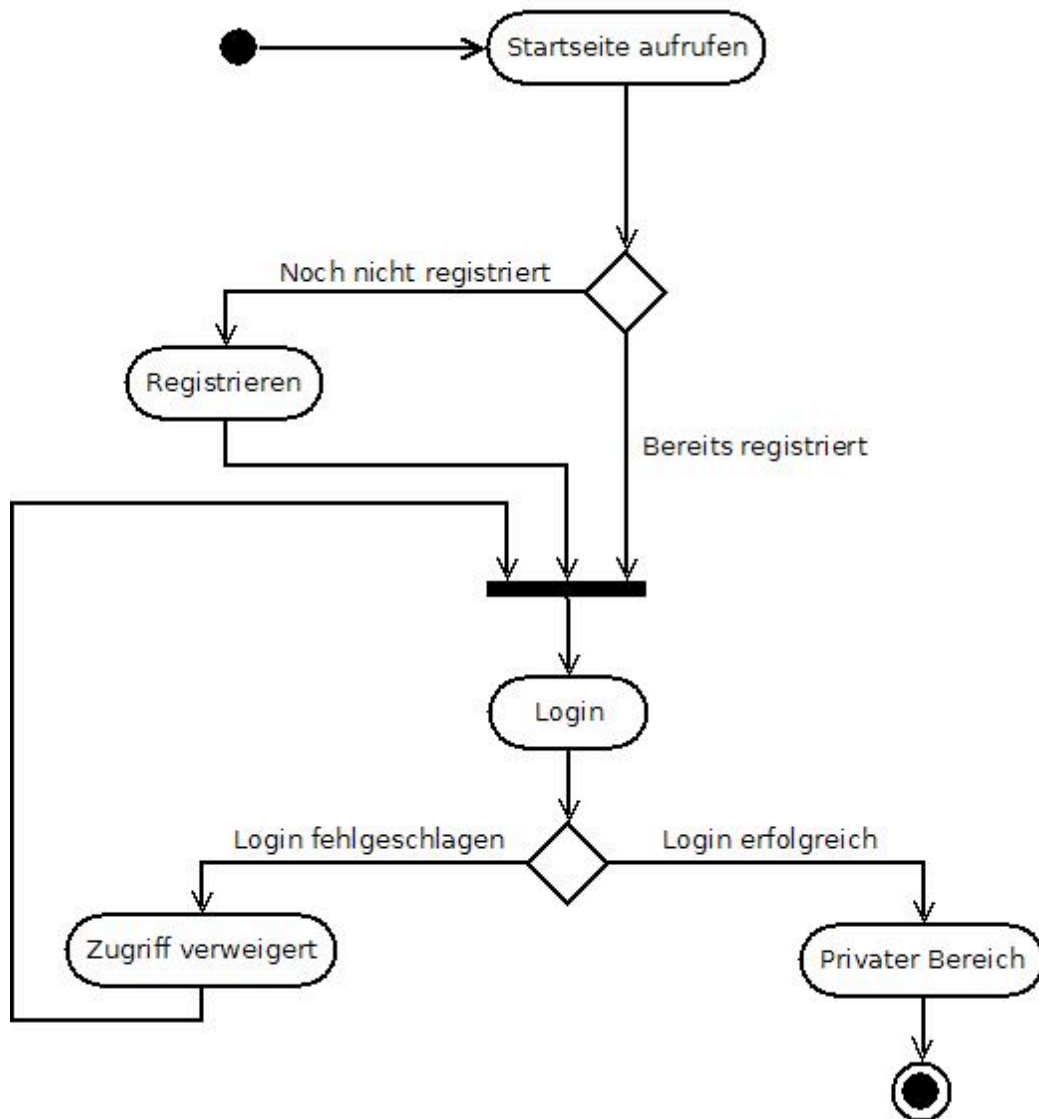
Abbildung 3: Ablauf des Loginprozesses (Aktivitätsdiagramm)

4.   Workflow: Storage
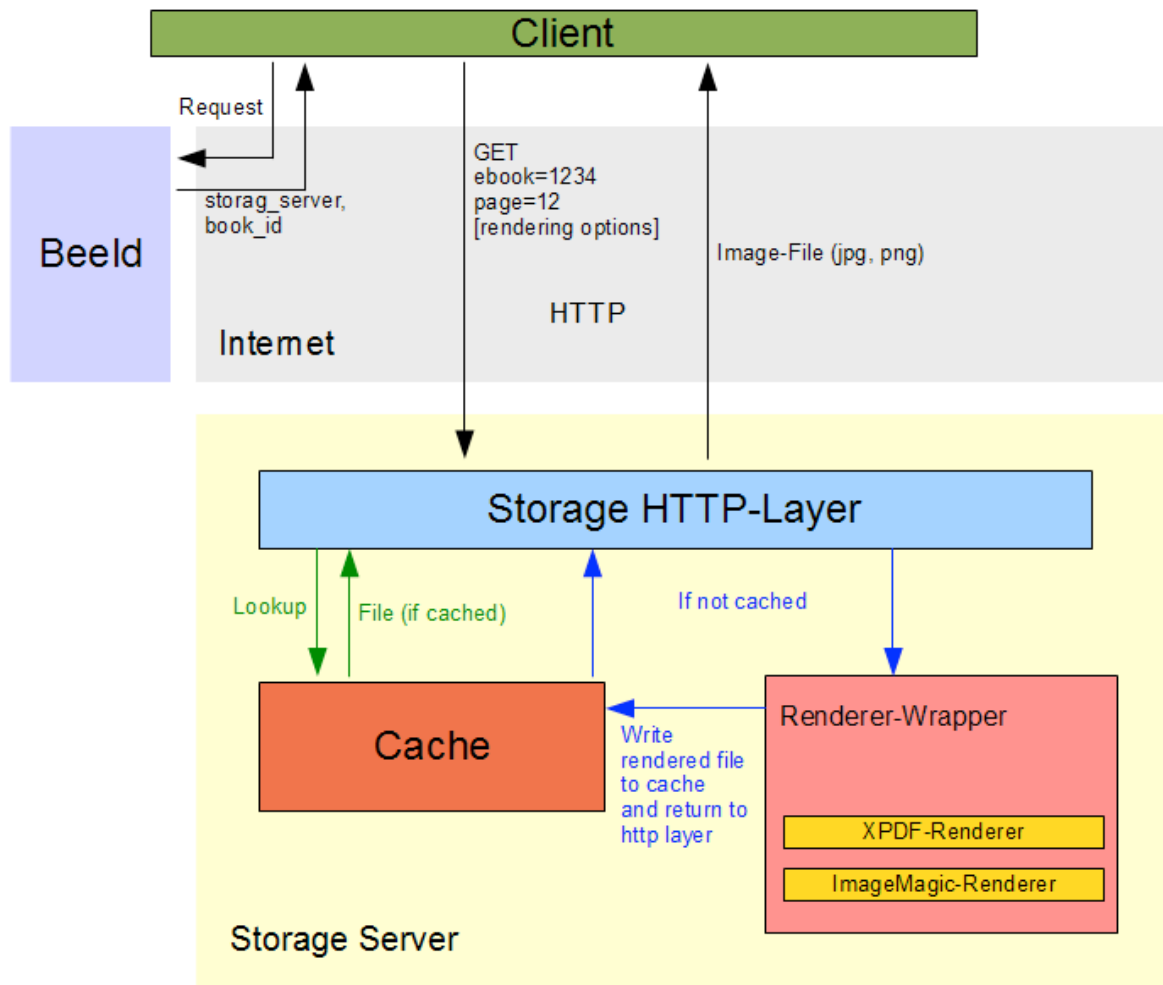
Abbildung 4: Ablauf zum Anzeigen einer Seite (Workflowdiagramm)

5. Workflow: PDF- Seite anschauen
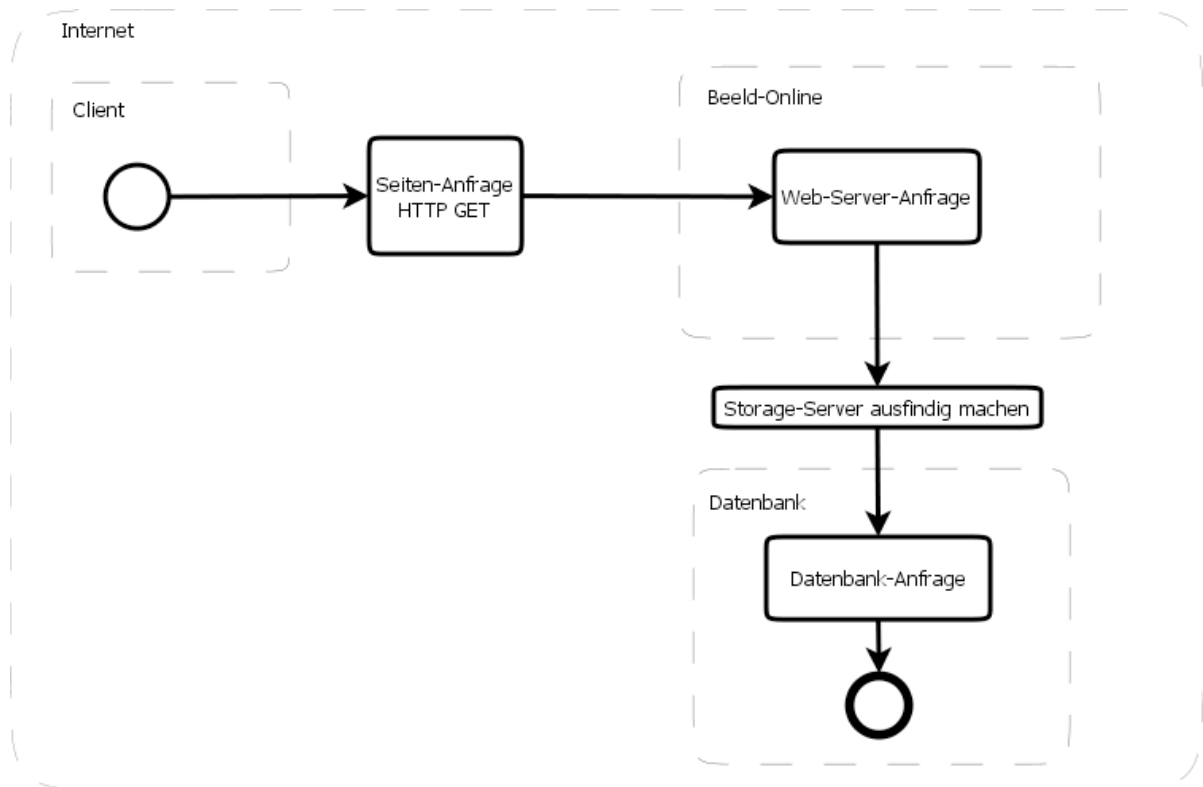
Abbildung 5: Ablauf Lokalisierung des Storage- Servers (Workflowdiagramm)

Abbildung 6: Direktaufruf einer einzelnen Seite vom Storage (Workflowdiagramm)

6. Workflow: Upload einer Datei

Abbildung 7: Ablauf Uploadvorgang von Benutzerrechner (Workflowdiagramm)

Abbildung 8: Ablauf Uploadvorgang von anderem Server (Workflowdiagramm)

7. Hardwaredaten

Konkrete Kenngrößen zur Ausstattung der Server auf denen „Beeld Online" ausgeführt werden soll, gibt es leider nicht. Da bei Webanwendungen die Last mit wachsender Benutzerzahl steigt, ist ein Festlegen der Minimal- und Maximalausstattung nicht möglich.
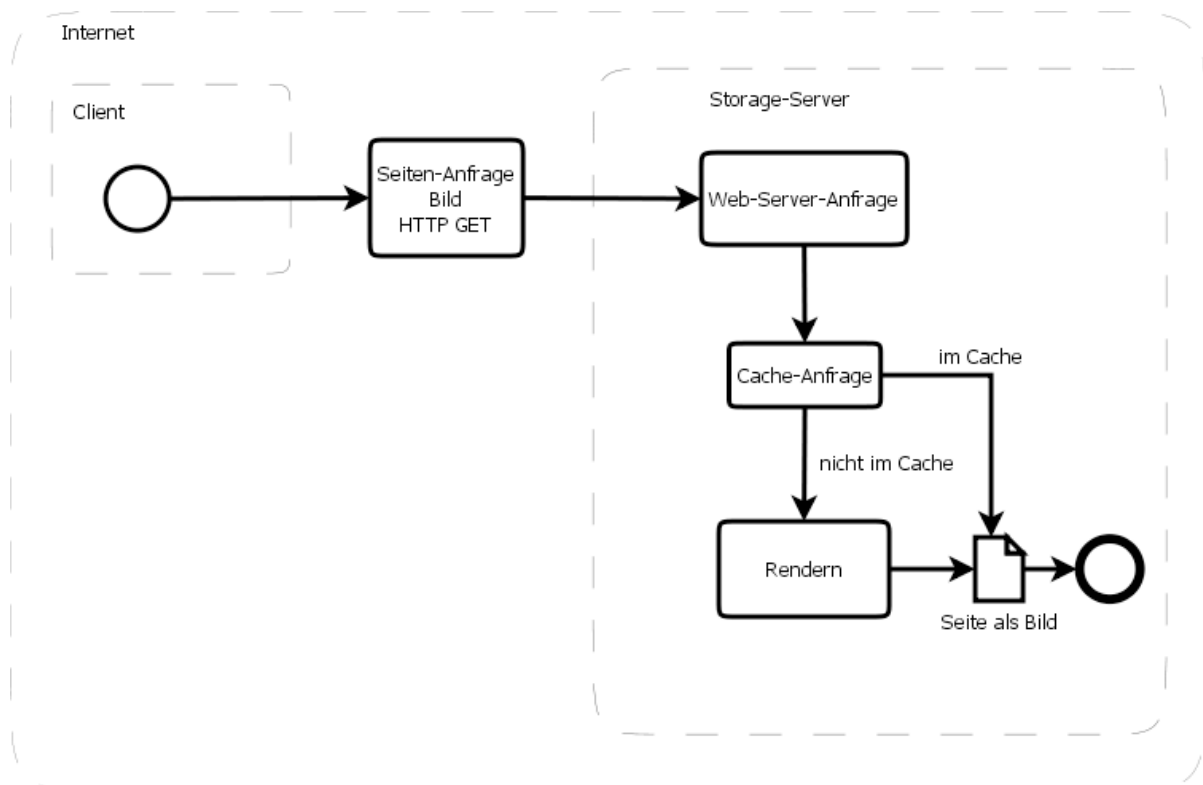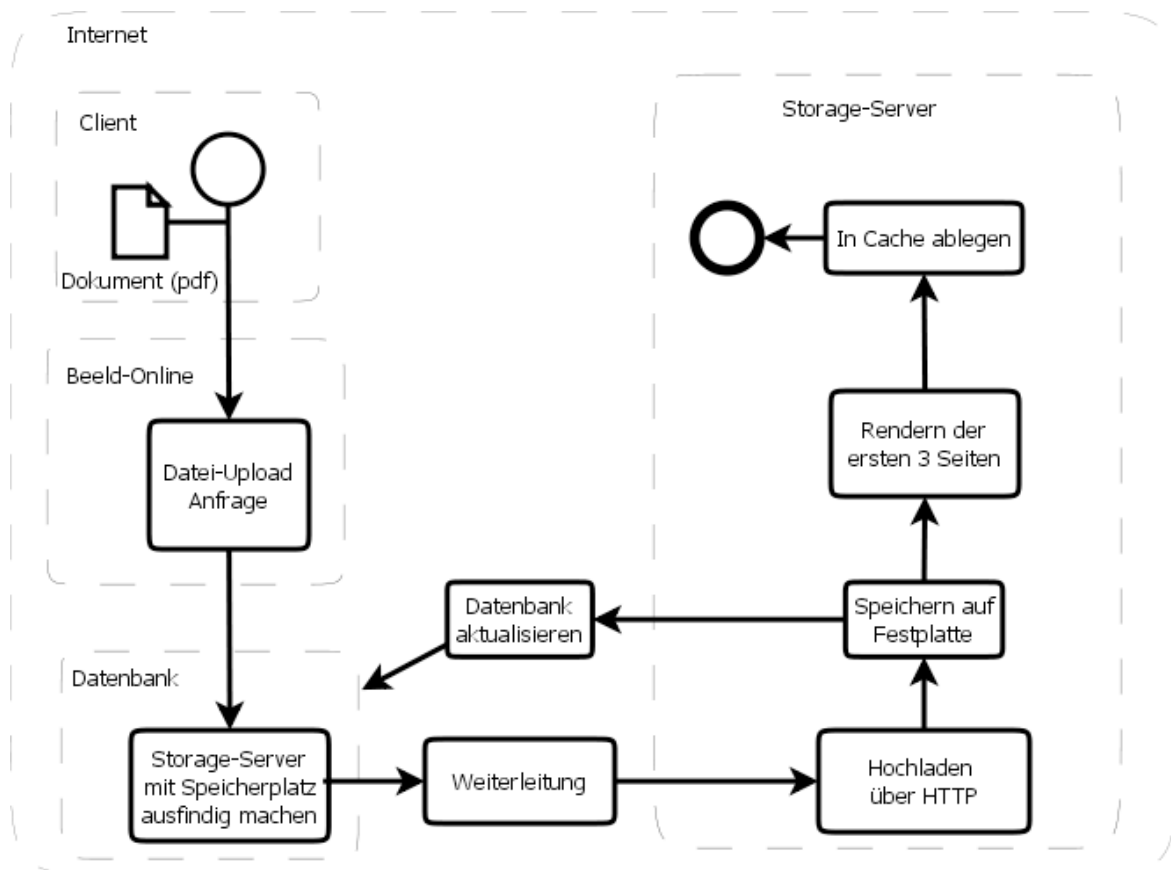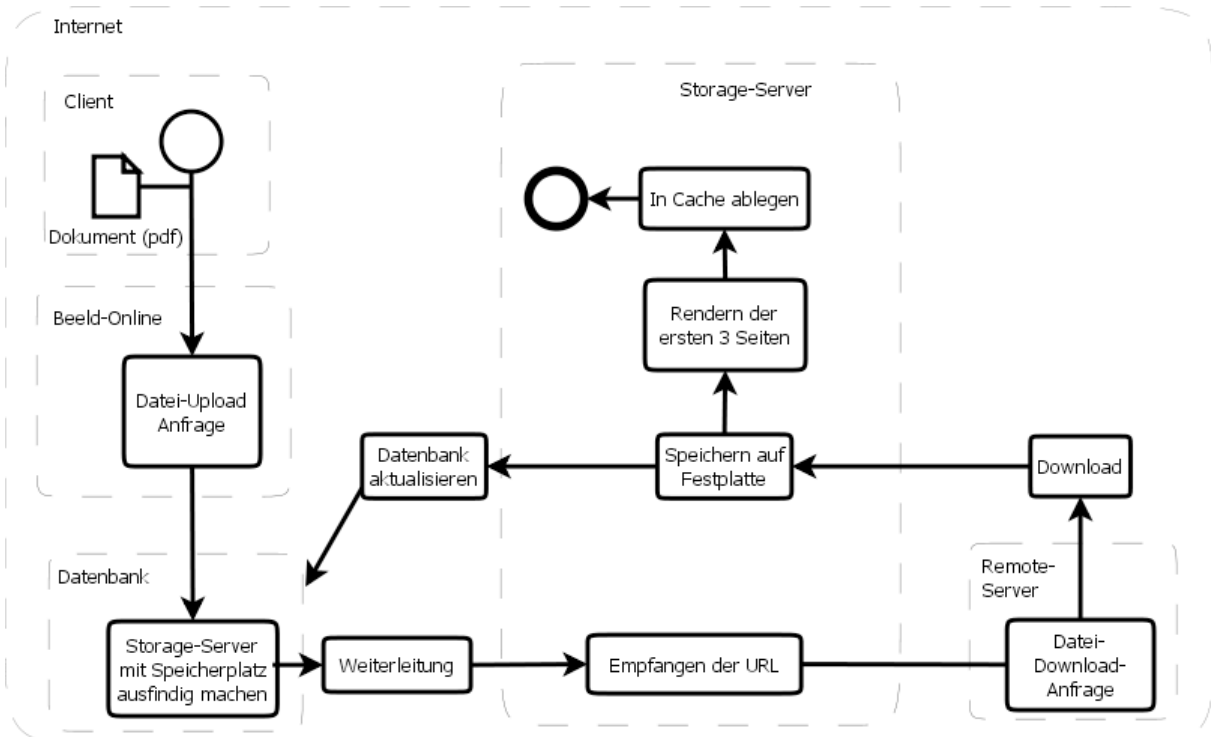
Für die Startkonfiguration für Web- Frontend, Datenbank und Storage/Converter wurden zwei VServer mit je 20GB Festplattenkapazität und 512MB beziehungsweise 768MB Arbeitsspeicher gewählt. Die CPU- Leistung ist unbekannt, da sich mehrere VServer eine unbekannte Anzahl an Prozessoren mit 3GHz teilen.

Es ist absehbar, dass bei einer Nutzerzahl von rund 100 Benutzer ein Upgrade beider Server nötig sein wird oder zusätzliche Server per load balancing hinzugefügt werden müssen.

8. Softwaredaten

Um „Beeld Online" betreiben zu können, sind verschiedene Bibliotheken und Programme nötig. In folgender Auflistung wird ein Überblick über die verwendete Software gegeben.

Web- Frontend

- Apache2 Webserver
  - mod_rewrite
- PHP, mindestens Version 5.2
  - php5-curl
  - php5-pgsql
  - php5-cli
- Zend Framework

Datenbank

- PGSQL- Server

Storage/Converter (Pyeeld)

- Python 2.4
- ImageMagik 6.5
- XPDF 3.0
- Tornado Web- Framework 0.2
- python-simplejson
- PyGreSQL

Zusätzlich wird PHP mit dem Suhosin- Patch des *hardened php project* betrieben. Dies ist keine Voraussetzung für den fehlerfreien Ablauf von „Beeld Online", sondern eine Sicherungsmaßnahme, um verschiedene potentielle Sicherheitslücken in der Standard- PHP- Bibliothek zu schließen.

„Beeld Online" wird unter der LGPL (GNU Lesser General Public License) lizensiert.

4. Produktfunktionen

/F101/ Der Benutzer registriert sich.

/F102/ Der Benutzer meldet sich am Portal an.

/F103/ Der Benutzer meldet sich vom Portal ab.

/F104/ Der Benutzer bearbeitet seine Stammdaten.

/F105/ Der Benutzer löscht seinen Zugang.

/F106/ Der Benutzer fordert ein neues Passwort an.

/F201/ Der Benutzer lädt ein Book von seinem Rechner hoch.

/F202/ Der Benutzer gibt eine URL ein, von der ein Book in sein Bookshelf geladen werden soll.

/F203/ Der Benutzer möchte ein Book aus seinem Bookshelf auf seinen Rechner herunterladen.

/F204/ Der Benutzer möchte ein Book aus seinem Bookshelf ansehen.

/F205/ Der Benutzer möchte ein Book aus seinem Bookshelf löschen.

/F301/ Der Benutzer möchte sich den Inhalt seines Bookshelfs ansehen.

/F302/ Der Benutzer möchte seinen Bookshelf durchsuchen.

Eine Onlinehilfe ist vorerst nicht vorgesehen, da die Anzahl der Funktionen so überschaubar ist und die GUI sehr einfach strukturiert wird. Die Bedienung sollte sich daher ohne Erläuterung erschließen.

5. Produktdaten

Aus Gründen des Datenschutz (Datensparsamkeit) werden wenige Daten vom Anwender verlangt. Zwingend verlangt werden:

/D101/ E-Mail- Adresse

/D102/ Username

/D103/ Passwort

Auf freiwilliger Basis können angegeben werden:

/D201/ Vorname

/D202/ Nachname

Es werden vorerst keine weiteren Daten vom Benutzer verarbeitet oder gespeichert.

6. Benutzeroberfläche

Die PHP- Dateien des Webfrontends sollen valides XHTML ausliefern. Auf die Verwendung von AJAX wird verzichtet werden, um auch Benutzern mit älteren Browsern den Zugriff auf „Beeld Online" zu ermöglichen.

An wichtigen Stellen wie dem Laden der einzelnen Seiten soll JavaScript eingesetzt werden, um dennoch eine flüssige Bedienung ohne große Wartezeiten zu gewährleisten.

7. Qualitätszielbestimmung

Auf welche Qualitätsanforderungen (Zuverlässigkeit, Robustheit, Benutzerfreundlichkeit, Effizienz, . . .) besonders viel Wert gelegt wird, kann der folgenden Tabelle entnommen werden.

	sehr wichtig	wichtig	weniger wichtig	unwichtig
Robustheit	✔			
Zuverlässigkeit	✔			
Korrektheit		✔		
Benutzerfreundlichkeit	✔			
Effizienz		✔		
Portierbarkeit			✔	
Kompatibilität			✔	

Tabelle 1: Anforderungen an die Qualität von „Beeld Online"

Die Bewertung der Kriterien basiert auf Vorgaben der Projektführung.

8. Testszenarien

In Anbetracht der kurzen Zeit die zum Entwickeln der Applikation vorgegeben ist, wird auf automatisierte Tests verzichtet.

Die Funktionalität des Portals wird durch die Entwickler getestet. Dies ist kein Testen auf Fehlerfreiheit oder Robustheit des Codes, aber ein Sicherstellen der Funktionalität.

9. Technische Produktumgebung

1.   Software

Die Entwicklung von „Beeld Online" erfolgt mit Hilfe mehrerer IDEs:

- Eclipse PDT (PHP)

- Komodo IDE (PHP, HTML)

- Pydev (Python)

Benutzte Bibliotheken sind im Abschnitt 3 (Produktübersicht) zu finden. Um die von Python verwendeten Bibliotheken zu übersetzen, wird der C++ - Compiler gcc in Version 4.1.2 eingesetzt.

2.   Hardware

Als Entwicklungs- und Testrechner dienen die Privatrechner der Projektteilnehmer. Zusätzlich wird die Software in einem speziellen Bereich der Live- Server getestet.

3.   Orgaware

Die Gruppenkommunikation erfolgt im direkten Gespräch und per Instant Messaging. Zum Austausch von Dokumenten und zur Dokumentation wird ein CMS verwendet, Termine und Meilensteine werden mittels eines Projektmanagement- Tools geplant.

Zur Versionsverwaltung des Quelltextes wird GIT verwendet, das Projekt ist auf http://www.github.com gehostet.

10.Glossar

API — Application Programming Interface; Schnittstelle eines Softwaresystems zum Anbinden anderer Programme an das System

Bitmap — Bilddatei, welche aus Pixeln aufgebaut ist, denen je eine Farbe zugeordnet ist

Book — hier Synonym für eine PDF- Datei

Bookshelf — Sammlung von Book des Benutzers

CHM — Compiled HTML Help; Dateiformat für Hilfedateien von Microsoft Windows

EPUB — electronic publication; offener Standard für E-Books des International Digital Publishing Forum

GIT — Software zur verteilten Versionsverwaltung von Dateien

GUI — Graphical User Interface; Mensch- Maschine- Schnittstelle

load balancing — große Menge an Anfragen mittels Lastenverteilung auf mehrere parallel arbeitende Systeme verteilen

Metadaten — Daten, die Informationen über andere Daten enthalten

PDF — Portable Document Format; plattformunabhängiges Dateiformat für Dokumente

Rapidshare — Internetdienstleister, der sich auf den einfachen Austausch großer Dateien spezialisiert hat

Workflow — oder auch Arbeitsablauf; eine vordefinierte Abfolge von Aktionen

11.Lizenzvereinbarung

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  The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free

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   b) The work must carry prominent notices stating that it is released under this License and any conditions added under section

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b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

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