Information Retrieval
(Temu Kembali Informasi)

Multimedia Retrieval

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Outline

- Multimedia retrieval
- Image
- Video
- Speech

Multimedia Retrieval

- The retrieval of text, image, video and sound data related to the interest of the user and their ranking according to a similarity degree.
- Multimedia retrieval is a relatively new discipline

Text IR versus Multimedia IR

- in text, words are readily available as basic units and structure is provided by punctuation and paragraphs
- in contrast, multimedia data is typically an uninterrupted stream, a linear story with few delimiters
- For non-text media, defining the semantic unit is a fundamental step to attain high-quality search
- In video, for instance, time is important—content changes with time

Image Retrieval

- Image retrieval : temu kembali citra
- Contoh : fingerprint

Citra

- Citra (Image) → kumpulan piksel
- Different types of pixels
  - –Binary (1 bit): black/white
  - –Grayscale (8 bits)
  - –Color (3 colors, 8 bits each): red, green, blue

Content-based Retrieval

- Idea: identify and extract features related to image contents
- The problem: content-based image retrieval is the task of retrieving images based on their contents
- Query-by-example (QBE)
  - user supplies an image and the system finds other images that are similar to it
  - ignores semantic information associated with images

Color-Based Retrieval

- Common QBE solution: feature summaries across entire image
  - average color: treat color as a global feature
  - does not depend on image resolution
    - even though, location of colors is very relevant
  - compare color histograms of different pictures
    - colors are quantized into one of N bins
    - number of pixels in each bin are compared
- Color histogram is independent of image resolution and viewing angle
- No need to perform foreground–background segmentation

Matching Image

- Best matching image with subimage identified

Query

Hasil

Query is before restoration work, target is a restored image.
Query and target image also differ in resolution

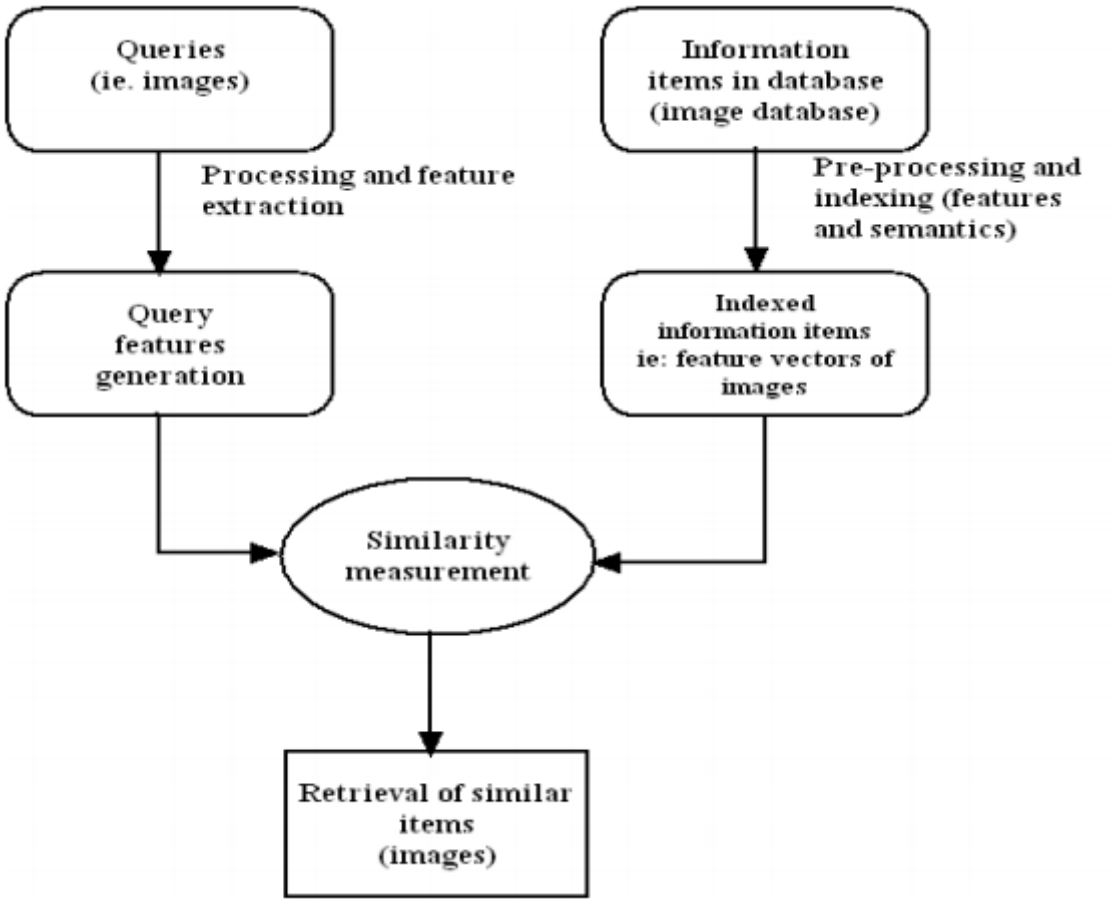
Matching Image

Query

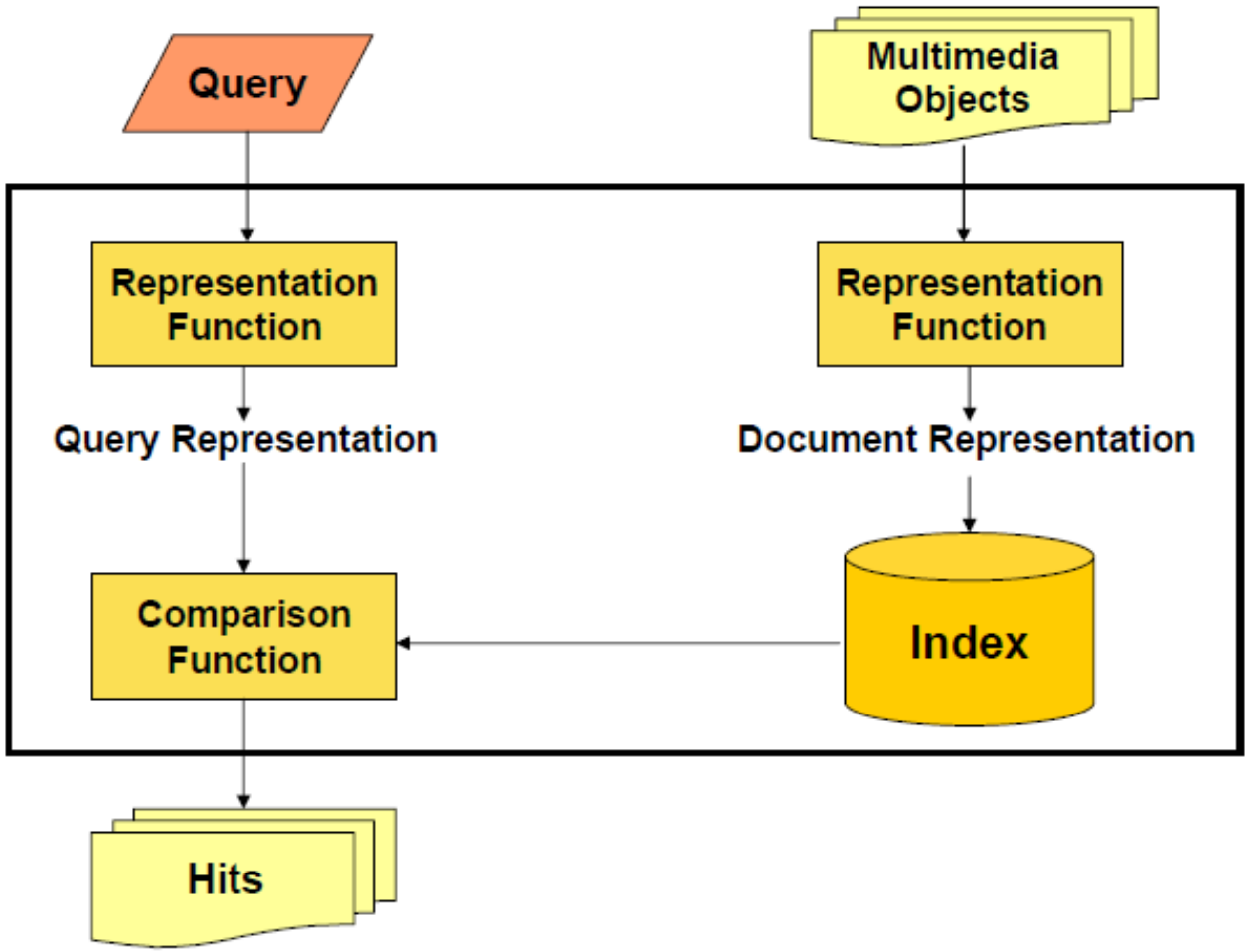
Best match found, with sub-image identified

Query is before restoration work, target is a restored image.
Query and target image also differ in resolution

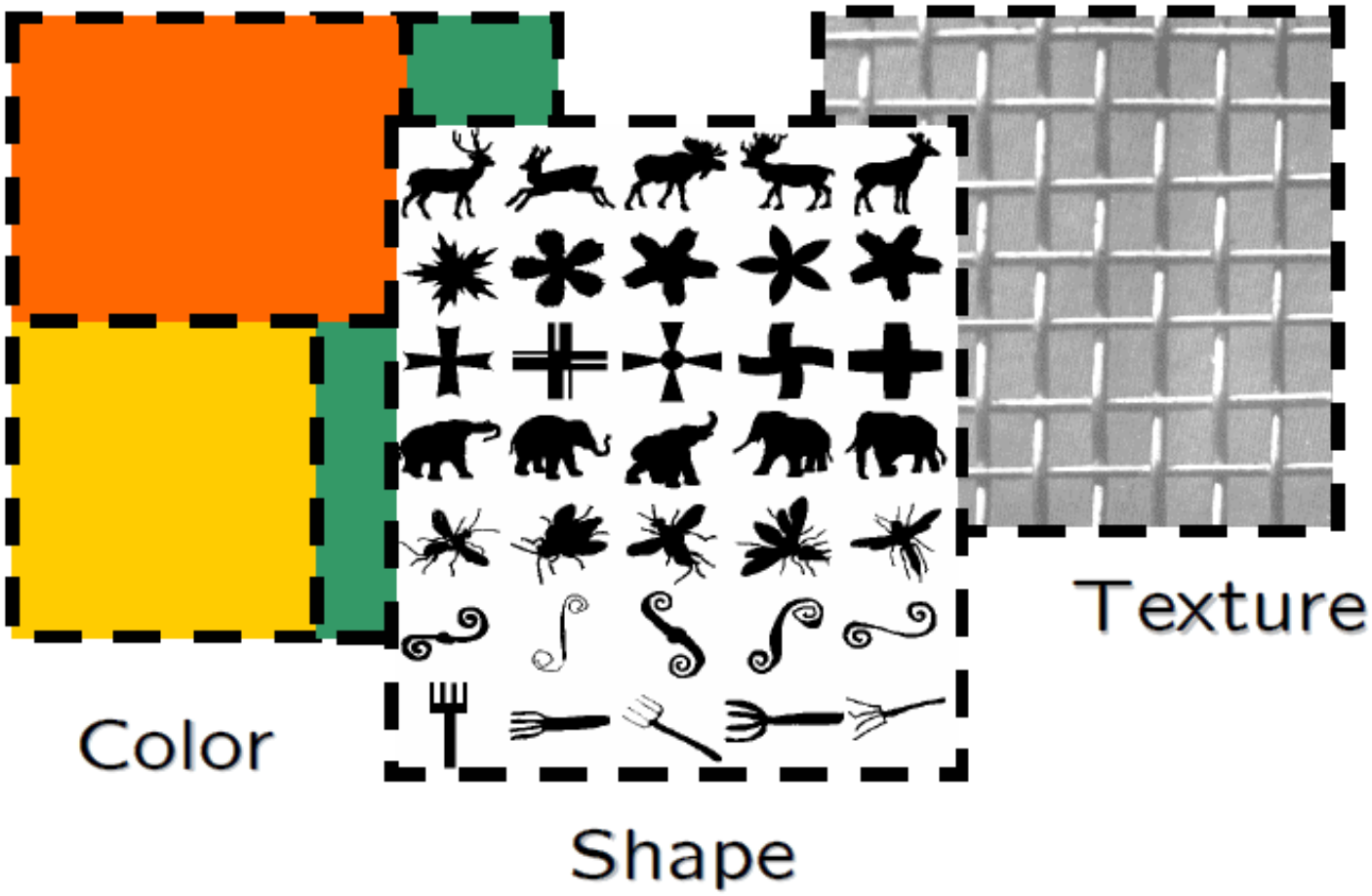
Multimedia Information Retrieval Sytem (MIRS)



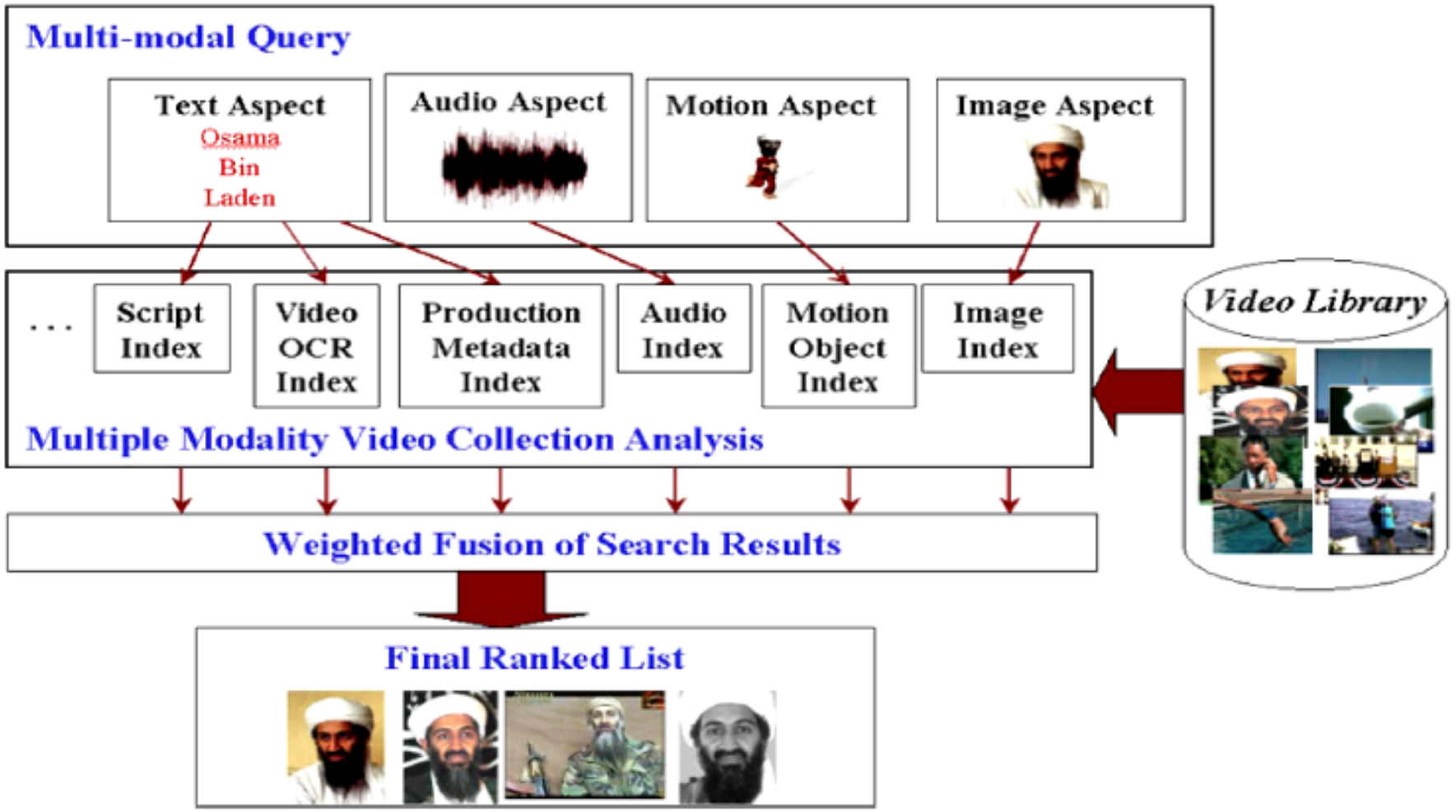
The IR Black Box



Visual Features



Combination of Evidence



Video Retrieval

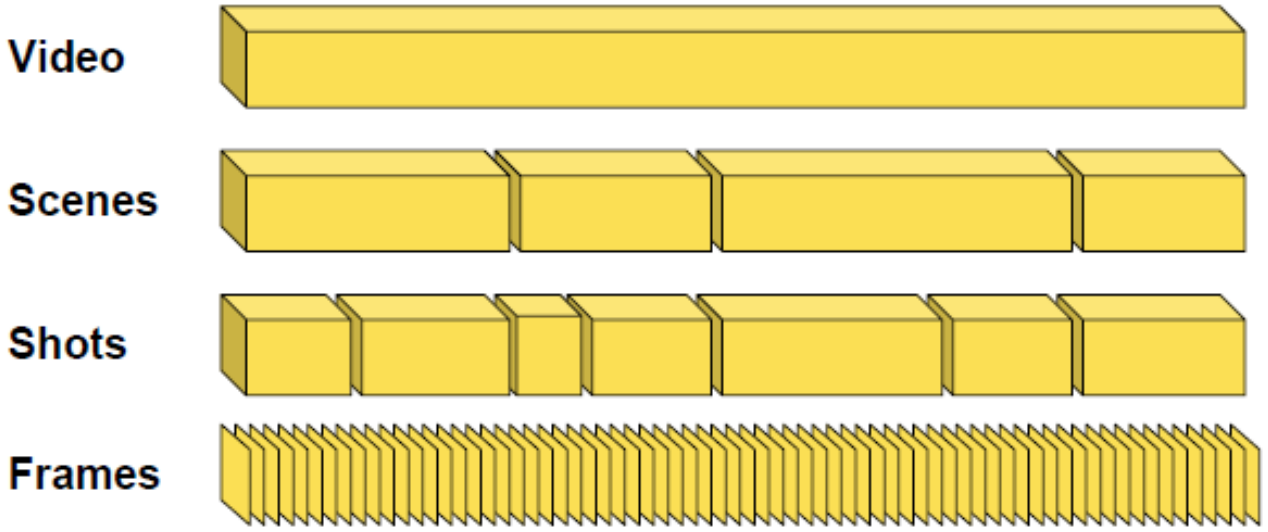
- Partitioning video into clips - video segmentation
- Key frame extraction
- Indexing and retrieval of key frames

Video

- A video is simply lots of images in rapid sequence

–Each image is called a frame

–Smooth motion requires about 24 frames/sec



The Structure of Video

Video Search

- Popular features/techniques:

–Color, Shape, Texture, Shape descriptors

–OCR, ASR

–A number of prototype or research products with small data sets

–More researched for visual queries

Video Data Management

1. Video Parsing

- Manipulation of whole video for breakdown into key frames.
  - –Scene: single dramatic event taken by a small number of related cameras.
  - –Shot: A sequence taken by a single camera
  - –Frame: A still image

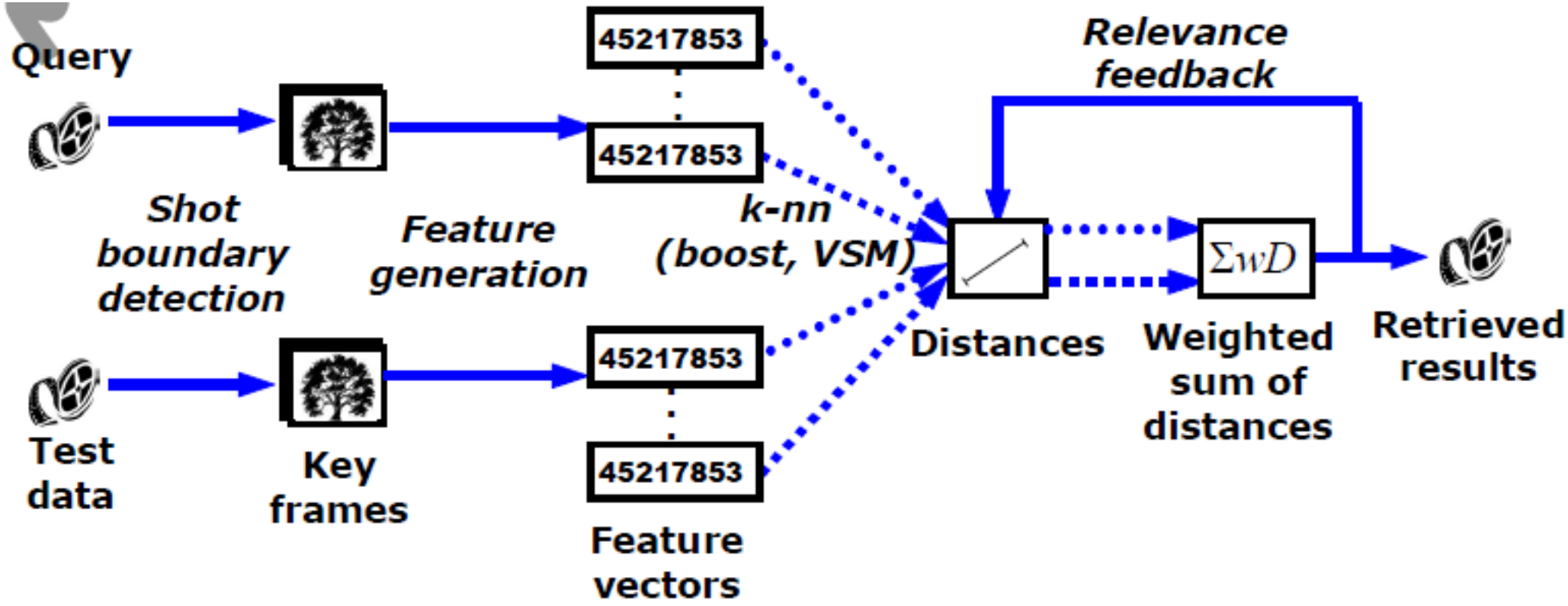
2. Video Indexing

- Retrieving information about the frame for indexing in a database.

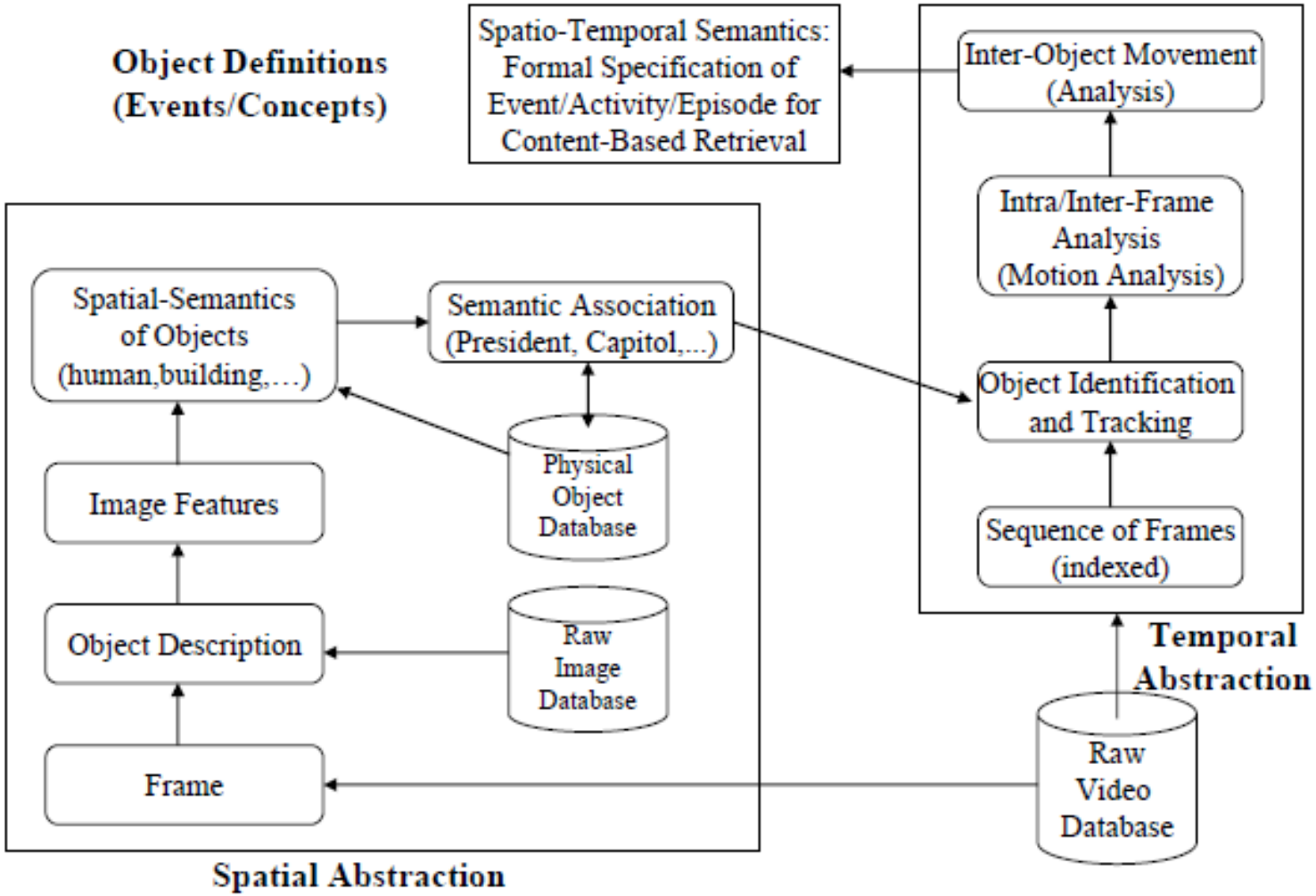
3. Video Retrieval and browsing

- Users access the db through queries or through interactions.

System overview



An Architecture for Video Database System



Video Data Management

- Metadata-based method
- Text-based method
- Audio-based method
- Content-based method
- Integrated approach

Metadata-based Method

- Video is indexed and retrieved based on structured metadata information by using a traditional DBMS
- Metadata examples are the title, author, producer, director, date, types of video.

Text-based Method

- Video is indexed and retrieved based on associated subtitles (text) using traditional IR techniques for text documents.
- Transcripts and subtitles are already exist in many types of video such as news and movies, eliminating the need for manual annotation.

Text-based Method

- Basic method is to use human annotation
- Can be done automatically where subtitles / transcriptions exist
  - –BBC: 100% output subtitled by 2008
- Speech recognition for archive material

Text Detection

Video Frames

Filtered Frames

AND-ed Frames

Source Video:

Time-Based Minimum Image:

Final VOCR Results:

FREEMAN
BLOCK
LOS
ANGELES
COUNT
SHERIFF

Text Region

Filtered Text

Binarized Segmnted

OCR: S H E R M A N B L O C K

Text Region

Filtered Text

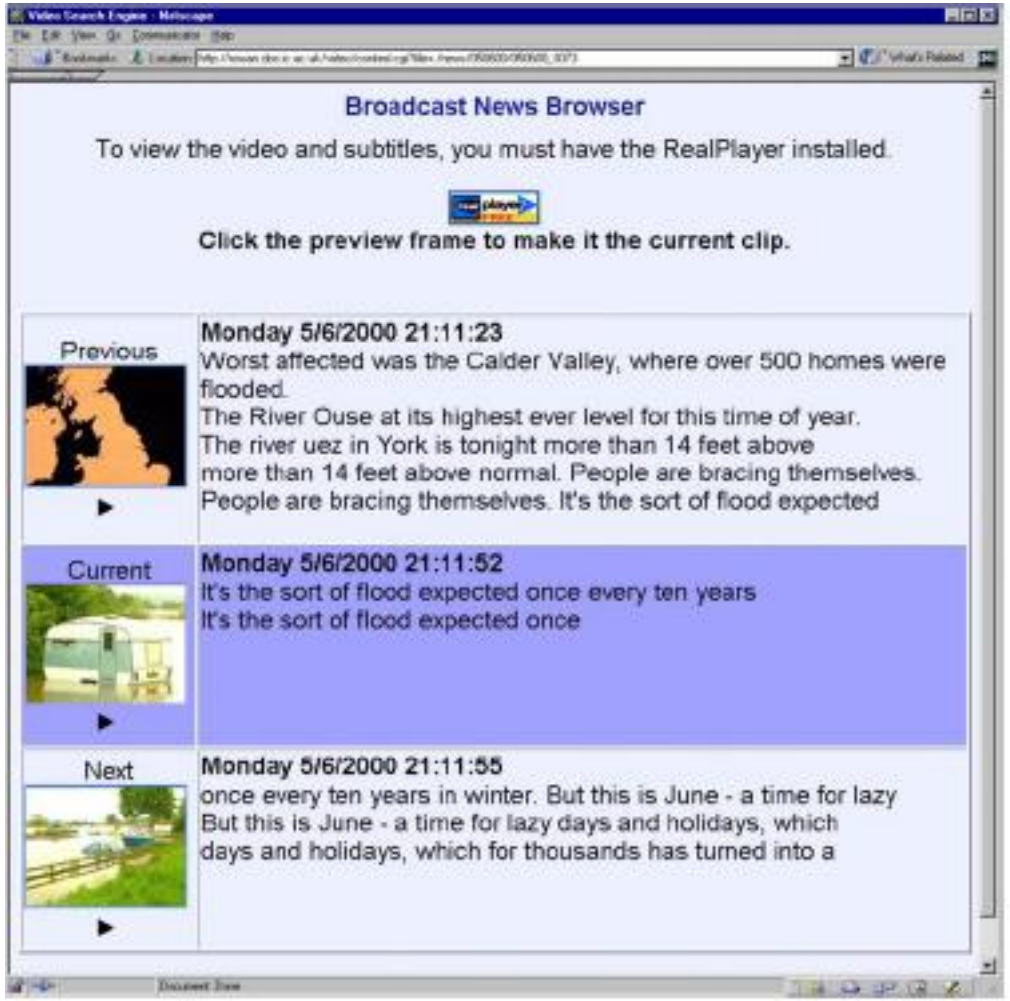
Binarized Segmnted

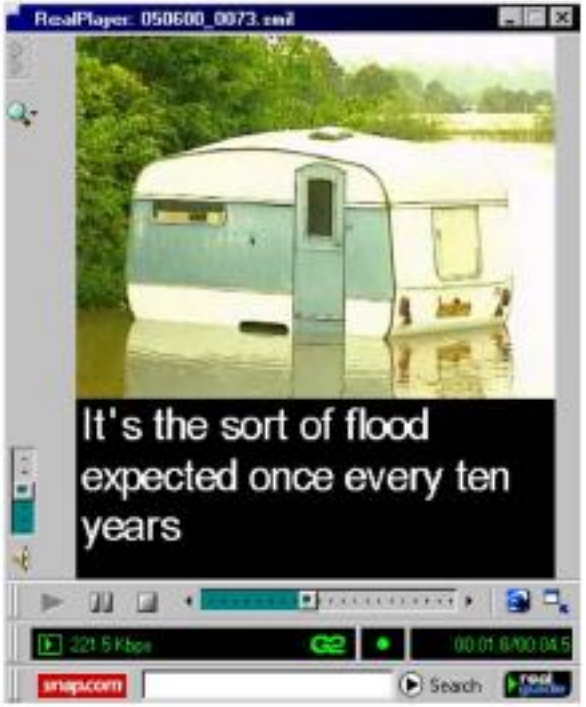
OCR: L O S A N G E L E S C O U N A S H E R I F F

Text-based Method

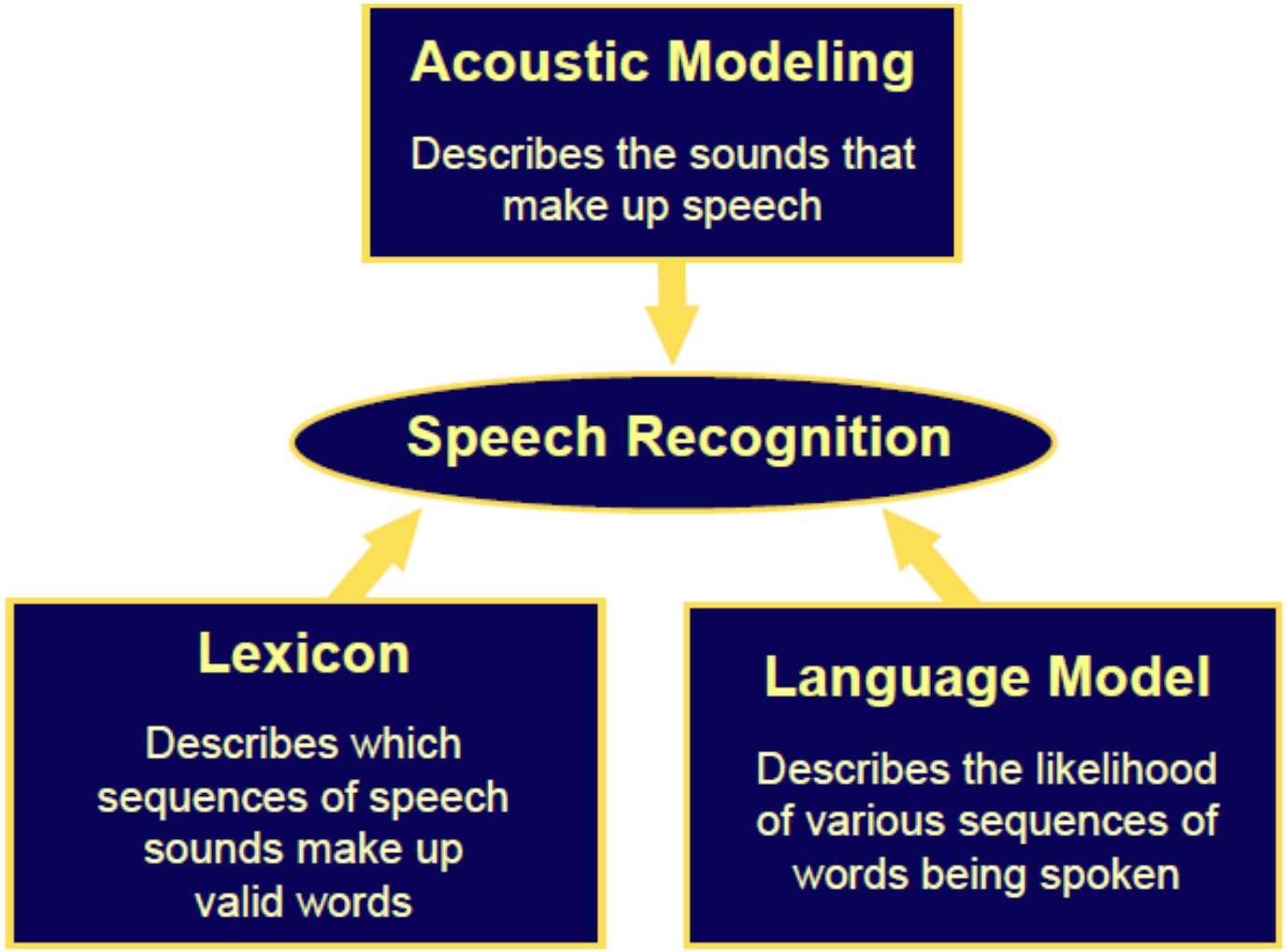
- Key word search based on subtitles
- Content based

Text-based Method

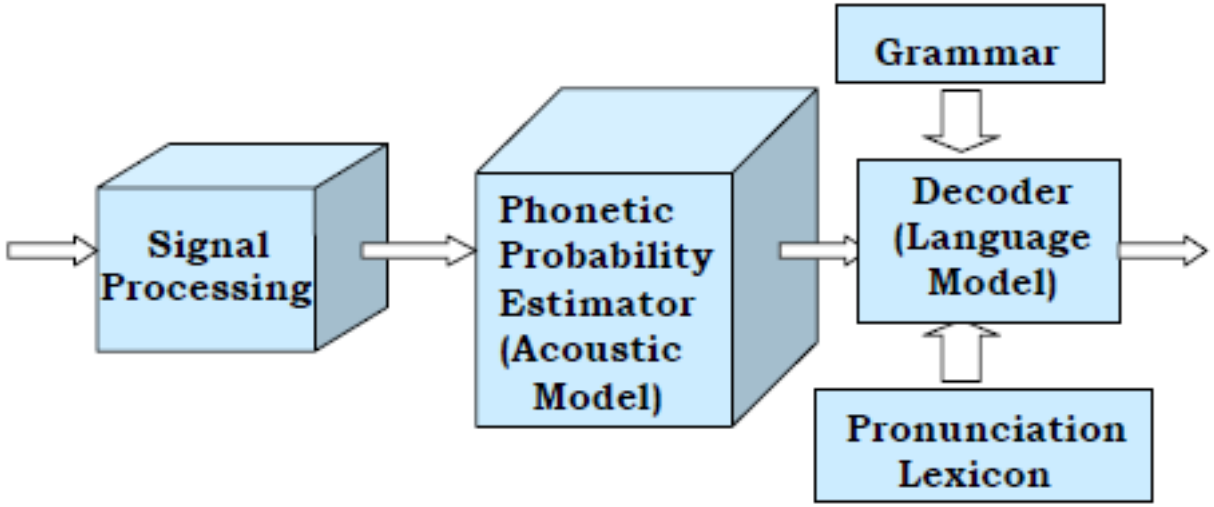




Speech (Suara)



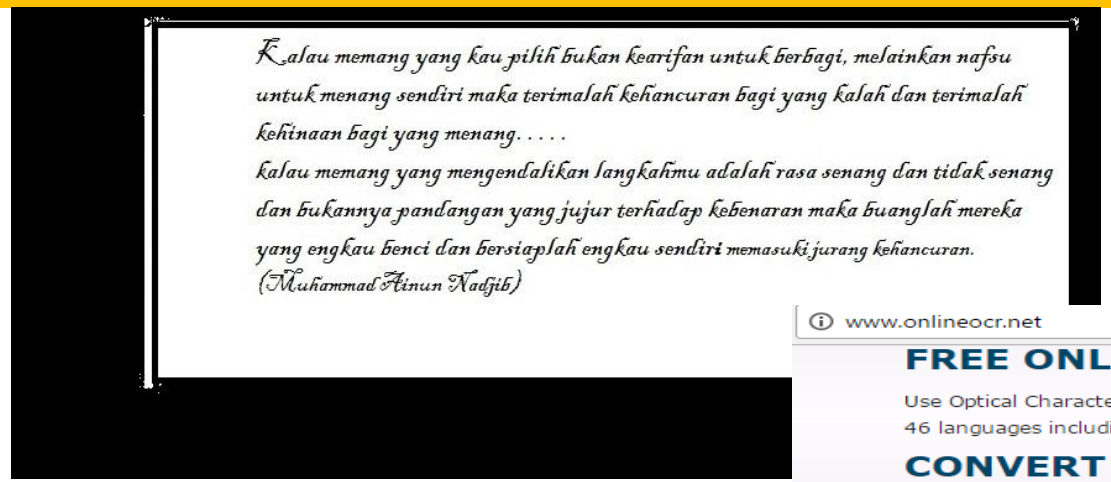
Speech Recognition in Brief



Speech Recognition

- The audio retrieval problem
  - The retrieval of audio tracks that match a vaguely specified audio-information need.
- This problem takes many forms such as:
  - fingerprinting: given a small snippet of sound, find an audio
  - object that matches it
  - speech recognition: given an audio track, recognize the text it
  - contains
  - speaker identification: given an audio track, recognize the
  - speaker(s) it contains
  - spoken document retrieval: given a text query, retrieve spoken
  - documents that match the query

http://www.onlineocr.net/



www.onlineocr.net

FREE ONLINE OCR SERVICE

Use Optical Character Recognition software online. Service supports 46 languages including Chinese, Japanese and Korean

CONVERT SCANNED PDF TO WORD

Extract text from PDF and images (JPG, BMP, TIFF, GIF) and convert into editable Word, Excel and Text output formats

1 STEP - Upload file | **2 STEP - Select language and output format** | **3 STEP - Convert**

Select file... | INDONESIAN | Text Plain (txt) | CONVERT

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