

# Kofax Mobile Credit and Debit Card Framework

## Administrator's Guide

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# Preface

This guide includes the information you need to get up to speed with your application.

## Related documentation

In addition to this guide, Kofax Mobile Bill Pay documentation set includes the following:

- Documentation for this product is available [online](#).
- *Real-Time Transformation Interface Administrator's Guide*: Contains essential information about installing and configuring the Real-Time Transformation Interface.
- *Kofax TotalAgility Administrator's Guide*: Contains essential information about installing and configuring Kofax TotalAgility.

## Training

Kofax offers both classroom and computer-based training that will help you make the most of your Kofax Capture solution. Visit the Kofax website at [www.kofax.com](http://www.kofax.com) for complete details about the available training options and schedules.

## Getting Help for Kofax Products

Kofax regularly updates the Kofax Support site with the latest information about Kofax products.

Documentation for this product is available [online](#).

To access some resources, you must have a valid Support Agreement with an authorized Kofax Reseller/ Partner or with Kofax directly.

Use the tools that Kofax provides for researching and identifying issues. For example, use the Kofax Support site to search for answers about messages, keywords, and product issues. To access the Kofax Support page, go to [www.kofax.com/support](http://www.kofax.com/support).

The Kofax Support page provides:

- Product information and release news  
Click a product family, select a product, and select a version number.
- Downloadable product documentation  
Click a product family, select a product, and click **Documentation**.
- Access to product knowledge bases

Click **Knowledge Base**.

- Access to the Kofax Customer Portal (for eligible customers)

Click **Account Management** and log in.

To optimize your use of the portal, go to the Kofax Customer Portal login page and click the link to open the *Guide to the Kofax Support Portal*. This guide describes how to access the support site, what to do before contacting the support team, how to open a new case or view an open case, and what information to collect before opening a case.

- Access to support tools

Click **Tools** and select the tool to use.

- Information about the support commitment for Kofax products

Click **Support Details** and select **Kofax Support Commitment**.

Use these tools to find answers to questions that you have, to learn about new functionality, and to research possible solutions to current issues.

## Chapter 1

# Overview

The Kofax Mobile Credit and Debit Card Framework contains a Kofax Transformation project for extracting information from images of credit and debit cards. It can be used with most such cards from around the world. This project extracts the card number and expiration date of embossed\* credit and debit cards.

**Note** \* A limited number of non-embossed cards are also supported; see the Limitations section below for more details.

Embossed cards have raised characters stamped into the plastic.

The Kofax Mobile Credit and Debit Card Framework supports the extraction of the following items:

- **CardNumber:** The value of the CardNumber field is extracted from the input image and validated using the Luhn algorithm. The Luhn algorithm is a public domain, industry standard checksum formula used to validate a large range of identification numbers, including those on credit and debit cards. In addition to the Luhn algorithm, the Issuer Identification Number (IIN) and the card number length are also used to validate the number.
- **ExpirationDate:** The value of the ExpirationDate field is extracted from the input image and validated (the month should be from 1 to 12; the year should be numeric).
- **CardNetwork:** The value of the CardNetwork field (for example, MasterCard or Visa) is determined by the first 6 digits of the card number. This is known as the Bank Identification Number (BIN) or Issuer Identification Number (IIN).

## Limitations

- Non-embossed credit and debit cards are not supported except for the following specific cards.
  - AT&T Access Card from Citi
  - Citi® / AAdvantage® Gold World Elite™ Mastercard®
  - CitiBusiness® / AAdvantage® Platinum Select® World Mastercard®
  - Costco Anywhere Visa® Card By Citi
  - Citi® Double Cash Card
  - EXPEDIA®+ VOYAGER CARD From Citi
  - Citi ThankYou® Preferred Card
  - Citi ThankYou® Premier Card
- The "Detect Card Type" feature will run both types of extraction (embossed and non-embossed for the specific cards above). Processing time when using this feature will be slower than when directly specifying the card type.
- Credit and debit cards with a vertical orientation are not supported.
- Card images captured when held in a user's hand may not crop or extract accurately.

- The Luhn check algorithm used during card number validation was designed to detect simple errors when manually keying card numbers, for example, when an adjacent number was accidentally pressed on a keypad. Numbers that fail the check are known to be invalid, but a number passing the check is not guaranteed to be valid. When combined with the additional validation checks related to the Issuer Identity Number (IIN) and card number length, the validity check is enhanced however still not a guarantee.

## New features in this release

The following features are new in this release:

- Support for the Kofax TotalAgility environment.
- Support for extracting CVV, the Card Verification Value, if present.
- Return current product version in ProductVersion field.

## New features in version 1.1

The Kofax Mobile Credit and Debit Card Framework support for non-embossed cards is limited to the cards listed in the limitations section above.

For supported non-embossed card types, the following additional data elements are returned:

- FirstName: The card holder's first name (if present)
- LastName: The card holder's last name (if present)
- MiddleName: The card holder's middle name (if present)
- NameSuffix: The card holder's name suffix (if present)

## Chapter 2

# Installation and configuration

## Installation

### Prerequisites

- Real-Time Transformation Interface version 2.0 or later, or Kofax TotalAgility 7.3 or later.
- IIS
- .NET Framework 4.5.2 or later
- Microsoft Visual C++ 2013 Redistributable

### Real-Time Transformation Interface configuration for Kofax Mobile Credit and Debit Card Framework

Follow the instructions in this section to use Kofax Mobile Credit and Debit Card Framework with either the Real-Time Transformation Interface or Kofax TotalAgility.

Modify the Real-Time Transformation Interface `web.config` file to include a mapping for the Kofax Mobile Credit and Debit Card Framework, referencing `KofaxCardCapture.fpr` as the in the Kofax Transformation Modules Project folder as the project.. Use one of the provided image perfection profiles described in the next section as the default image perfection profile, and set the `separateExtractionProcessPool` option to `TRUE` as shown in the example below.

See the *Real-Time Transformation Interface Administrator's Guide* for detailed instructions.

#### Example

```
<project projectMapping="CreditCard"
projectFile="C:\KofaxCardCapture\KTM Project\KofaxCardCapture.fpr"
ipProfile="C:\KofaxCardCapture\KTM Project\ImagePerfectionProfile_CreditCard.txt"
processPoolInitialSize="2"
processPoolThreshold="1"
separateExtractionProcessPool="true" />
```

One image processing profile file is provided with Kofax Mobile Credit and Debit Card Framework. This file can be found at the root of the provided Transformation project folder `KofaxMobileCreditAndDebitCardFramework-1.2.0.ZIP\KTM Project`.

#### ImagePerfectionProfile\_CreditCard.txt

The image processing operation string for supported cards is as follows:



```
_DeviceType_2_Do90DegreeRotation_4_DoCropCorrection_DoScaleImageToDPI_300  
_DoSkewCorrectionPage_DocDimLarge_3.375_DocDimSmall_2.125_LoadInlineSetting_  
[CSkewDetect.correct_illumination.Bool=0]_LoadInlineSetting_  
[CSkewDetect.double_bkg_check_variability_thr.Int=-1]_LoadInlineSetting_  
[CSkewDetect.color_stats_error_sum_thr_white_bkg=24]
```

- `_DeviceType_2`: specifies document images come from phone cameras.
- `_Do90DegreeRotation_4`: added to turn the images right way up.
- `_DoCropCorrection_`: added to crop the images.
- `_DoScaleImageToDPI_300`: specifies output image resolution of 300 DPI.
- `_DoSkewCorrectionPage_`: added to deskew the images based on edges, because content is parallel to document edges.
- `_DocDimLarge_3.375_DocDimSmall_2.125`: specifies dimensions of physical document in inches.
- `_LoadInlineSetting_[CSkewDetect.correct_illumination.Bool=0]`: added to reduce processing time.
- `_LoadInlineSetting_[CSkewDetect.double_bkg_check_variability_thr.Int=-1]`: improve edge detection by disabling recalculation of background statistics.
- `_LoadInlineSetting_[CSkewDetect.color_stats_error_sum_thr_white_bkg=24]`: improve edge detection by specifying a slightly reduced background color detection sensitivity.

## Configuration with Kofax TotalAgility for Kofax Mobile Credit and Debit Card Framework

Follow the instructions in this section to use Kofax Mobile Credit and Debit Card Framework with Kofax TotalAgility. The Kofax TotalAgility package includes a process map that can be used to perform extraction.

1. Log in to the Kofax TotalAgility designer.
2. Navigate to the Packages designer.
3. Select Import Package.
4. Browse to the `KofaxCardCapture.zip` file in the Kofax TotalAgility Package folder.
5. Click Import to import the package.

## Uninstallation

To uninstall: Real-Time Transformation Interface

1. Remove CreditCard project mapping in the Real-Time Transformation Interface `web.config` file.
2. If an image perfection profile for this project was added to the `<ipProfiles>` section, remove it as well.
3. Delete the Kofax Transformation Modules project folder from its extracted location. For example, `C:\KofaxCardCapture\KTM Project`.

To uninstall: Kofax TotalAgility

1. Log in to the Kofax TotalAgility designer.
2. Navigate to the Data Designer.
3. Delete the KofaxCardCapture group under the KofaxSmcs\KofaxCardCapture category.
4. Navigate to the Process Designer.
5. Delete the KofaxCardCapture and KofaxCardCaptureSync processes under the KofaxSMCs \KofaxCardCapture category.

## Upgrade

To upgrade from the prior release, please follow the instructions in the Uninstallation section to remove the existing setup. Then follow the Installation section to install this release.

## High-level flow

When extracting information from a credit or debit card, the following process occurs.

1. The color image of the card, ideally on a solid color background, is deskewed and cropped to just the card itself.
2. Extraction is performed on the cropped image.

The Kofax Mobile Credit and Debit Card Framework is also capable of performing any of the steps prior to Extraction. On any platform, control of which steps the project will perform is driven by the settings in the project, or the parameters to the current request.

## Settings and parameters

The following settings and parameters can be used:

### Input parameters

The following parameters and their valid values are described below.

**Note** When using the Real-Time Transformation Interface, all parameters must be prefixed with an x. For example, the ExtractMethod parameter should be sent to the server as xExtractMethod.

#### **ExtractMethod**

This parameter specifies which extraction method to use.

**ExtractMethod parameter values**

| ExtractMethod | Meaning   | Notes   |
|---------------|---|---|
| Detect        | Extract the image as an embossed card and return the result if the extracted card number is valid. If not, attempt to extract the image as one of the supported non-embossed cards and return the result if the extracted card number is valid. When both results are invalid, evaluate the extraction results and return the result with the highest average character confidence. Null is returned if no results were found using either extraction method. | This is the default method.   |
| Embossed      | Use embossed card extraction method.  |   |
| NonEmbossed   | Use non-embossed extraction method.   | This method only supports the specific cards identified in the Limitations section. |

**ImagePerfection**

This parameter indicates whether the framework should apply an image perfection profile (crop/deskew/scale) to the image before extracting. The default value is TRUE.

**Note** When the Real-Time Transformation Interface parameter ProcessImage is used and set to TRUE, ImagePerfection must be set to FALSE to avoid double processing.

**Optional Real-Time Transformation Interface input parameters****ProcessImage**

This parameter indicates whether RTTI should apply image perfection profile to the image before sending to the framework. Default value is FALSE. (See ImagePerfection parameter above.)

**ipProfile**

This parameter specifies, in combination with ProcessImage, which image perfection profile Real-Time Transformation Interface should use.

**Server responses and URL calls**

By default, the server relays data extracted from the Kofax Transformation Modules project in a JSON format with a structure similar to the following sample. Note that the extraction confidence returned in the JSON response will only show a confidence of 1.0 or 0.0. A confidence of 1 indicates that a value was returned for that field, 0 indicates that no value was returned.

The following fields are returned:

- CardNumber
- ExpirationDate

- CardNetwork
- CardExpired
- DocumentType
- FirstName\*
- LastName\*
- MiddleName\*
- NameSuffix\*
- CVV (if present)\*

**Note** \* These fields are only extracted for the non-embossed cards identified in the Limitations section.

## Real-Time Transformation Interface

The following descriptions are for Server Responses and URL Calls for the Real-Time Transformation Interface.

### Example URL calls

All examples assume Real-Time Transformation Interface is configured at `http://localhost/rtti` and the project mapping is `CreditCard`.

- **Raw color image of an embossed card:** `http://localhost/rtti/api/CreditCard` or, `http://localhost/rtti/api?CreditCard?xExtractMethod=Detect&xImagePerfection=true`.
- **Cropped image of an embossed card:** `http://localhost/rtti/api/CreditCard?xExtractMethod=Detect&xImagePerfection=false`.
- **Raw color image of a supported non-embossed card:** `http://localhost/rtti/api/CreditCard?xExtractMethod=Detect&xImagePerfection=true` or, `http://localhost/rtti/api/CreditCard?xExtractMethod=NonEmbossed&xImagePerfection=true`.
- **Cropped color image of a supported non-embossed card:** `http://localhost/rtti/api/CreditCard?xExtractMethod=NonEmbossed&xImagePerfection=false`.

### Example of a typical POST request

#### Request URL

`http://<servername>/rtti/api/CreditCard`

#### Request Header

```
Accept: application/json
Content-Type: multipart/form-data; boundary=-----acebdf13572468
Content-Length: 1169337
```

#### Request Body

```
-----acebdf13572468
Content-Disposition: form-data; name="xExtractMethod"
```

```
Detect
-----acebdf13572468
Content-Disposition: form-data; name="xImagePerfection"

true
-----acebdf13572468
Content-Disposition: form-data; name="image"; filename="04565.JPG"
Content-Type: image/jpeg

<Binary Image Data Will Be Here >
-----acebdf13572468--
```

## Response

```
{
  "extractionClass": "CardCapture",
  "classificationResult": [],
  "fields": [{
    "name": "DocumentType",
    "text": "EmbossedCard",
    "valid": true,
    "errorDescription": "",
    "left": -1,
    "top": -1,
    "height": -1,
    "width": -1,
    "pageIndex": -1,
    "confidence": 1.0,
    "formattingFailed": false,
    "fieldAlternatives": []
  },
  {
    "name": "CardNumber",
    "text": "9995092009212014",
    "valid": true,
    "errorDescription": "",
    "left": -1,
    "top": -1,
    "height": -1,
    "width": -1,
    "pageIndex": -1,
    "confidence": 1.0,
    "formattingFailed": false,
    "fieldAlternatives": []
  },
  {
    "name": "ExpirationDate",
    "text": "11/00",
    "valid": true,
    "errorDescription": "",
    "left": -1,
    "top": -1,
    "height": -1,
    "width": -1,
    "pageIndex": -1,
    "confidence": 1.0,
    "formattingFailed": false,
    "fieldAlternatives": []
  },
  {
    "name": "CardNetwork",
    "text": "Visa",
```

```
"valid": true,
"errorDescription": "",
"left": -1,
"top": -1,
"height": -1,
"width": -1,
"pageIndex": -1,
"confidence": 0.0,
"formattingFailed": false,
"fieldAlternatives": []
},
{
  "name": "CardExpired",
  "text": "True",
  "valid": true,
  "errorDescription": "",
  "left": -1,
  "top": -1,
  "height": -1,
  "width": -1,
  "pageIndex": -1,
  "confidence": 1.0,
  "formattingFailed": false,
  "fieldAlternatives": []
},
{
  "name": "FirstName",
  "text": "",
  "valid": false,
  "errorDescription": "",
  "left": -1,
  "top": -1,
  "height": -1,
  "width": -1,
  "pageIndex": -1,
  "confidence": 0.0,
  "formattingFailed": false,
  "fieldAlternatives": []
},
{
  "name": "LastName",
  "text": "",
  "valid": false,
  "errorDescription": "",
  "left": -1,
  "top": -1,
  "height": -1,
  "width": -1,
  "pageIndex": -1,
  "confidence": 0.0,
  "formattingFailed": false,
  "fieldAlternatives": []
},
{
  "name": "MiddleInitial",
  "text": "",
  "valid": false,
  "errorDescription": "",
  "left": -1,
  "top": -1,
  "height": -1,
  "width": -1,
  "pageIndex": -1,
  "confidence": 0.0,
```

```
"formattingFailed": false,
"fieldAlternatives": []
},
{
  "name": "NameSuffix",
  "text": "",
  "valid": false,
  "errorDescription": "",
  "left": -1,
  "top": -1,
  "height": -1,
  "width": -1,
  "pageIndex": -1,
  "confidence": 0.0,
  "formattingFailed": false,
  "fieldAlternatives": []
},
{
  "name": "CVV",
  "text": "",
  "valid": false,
  "errorDescription": "",
  "left": -1,
  "top": -1,
  "height": -1,
  "width": -1,
  "pageIndex": -1,
  "confidence": 0.0,
  "formattingFailed": false,
  "fieldAlternatives": []
}],
"sessionKey": "4ee544fb-9a9d-48e0-8729-5997c3be7ef6",
"environmentId": null,
"instanceId": null,
"documentId": "e3aa7b2e-7fb7-4f50-9d49-69fc2e6e31ab",
"words": null,
"processedImages": null,
"result": "Success",
"errorType": "None",
"errorDescription": null,
"errorCode": 0
}
```

## Kofax TotalAgility

Here are a sample Request URL call and JSON response for a typical US driver license. For more information refer to the Kofax TotalAgility documentation.

### Request URL

```
http://<servername>/TotalAgility/Services/SDK/JobService.svc/json/
CreateJobSyncWithDocuments
```

### Request Header

```
Accept: application/json
Host: <servername>
Content-Type: application/json
```

## Request Body

```

{
  "jobWithDocsInitialization": {
    "InputVariables": [
      {
        "Id": "ImagePerfection",
        "Value": true
      }
    ],
    "Documents": [
      {
        "Base64Data": null,
        "Data": null,
        "DocumentGroup": null,
        "DocumentName": null,
        "DocumentTypeId": null,
        "FieldsToReturn": null,
        "FilePath": null,
        "FolderId": null,
        "FolderTypeId": null,
        "MimeType": null,
        "PageDataList": [
          {
            "Data": null,
            "Base64Data": "<Image Data Will Be Here>",
            "MimeType": "image/jpeg",
            "RuntimeFields": {}
          }
        ],
        "ReturnAllFields": true,
        "ReturnFullTextOcr": false,
        "RuntimeFields": null
      }
    ],
    "StoreFolderAndDocuments": false,
    "StartDate": null
  },
  "processIdentity": {
    "Id": null,
    "Name": "KofaxCardCaptureSync",
    "Version": 0
  },
  "sessionId": "C640521793431F4486D4EF1586672385",
  "variablesToReturn": {}
}

```

## Response

```

{
  "d": {
    "__type": "SyncJobWithDocuments:http://www.kofax.com/agility/services/sdk",
    "JobIdentity": {
      "__type": "JobIdentity:http://www.kofax.com/agility/services/sdk",
      "Id": "04D207BAF44D47B58F7BD568A284A955"
    },
    "DocumentId": "af0bbb17-73e2-4275-b76e-a6db01513068",
    "FolderId": "08e4dc55-40bb-4125-a8b0-a6db01513068",
    "ReturnedDocumentFields": [
      {
        "__type": "DocumentFields2:http://www.kofax.com/agility/services/sdk",
        "DocumentId": "af0bbb17-73e2-4275-b76e-a6db01513068",
        "ReturnedDocumentFields": [
          {

```



```
"__type":"RuntimeField3:http://www.kofax.com/agility/services/sdk",
"Id":"3C1557D3C52440E7841FFFE1C57C9FE0",
"TableRow":-1,
"TableColumn":-1,
"Value":"NonEmbossedCard",
"Name":"DocumentType",
"Valid":true,
"ErrorDescription":null,
"ReviewForcedValid":false,
"Verified":false,
"Confidence":1,
"ReviewForcedValidDescription":null,
"ExtractionConfident":false,
"Left":-1,
"Top":-1,
"Width":-1,
"Height":-1,
"PageIndex":-1,
"DocumentFieldAlternatives":[
{
  "__type":"FieldAlternative2:http://www.kofax.com/agility/services/sdk",
  "PageIndex":-1,
  "Confidence":1,
  "Text":"NonEmbossedCard",
  "Height":-1,
  "Left":-1,
  "Top":-1,
  "Width":-1
}],
"TableCells":[]
},
{
  "__type":"RuntimeField3:http://www.kofax.com/agility/services/sdk",
  "Id":"DE7004262ADF4229B901A0D05BFE8DA0",
  "TableRow":-1,
  "TableColumn":-1,
  "Value":"9995092009212014",
  "Name":"CardNumber",
  "Valid":true,
  "ErrorDescription":null,
  "ReviewForcedValid":false,
  "Verified":false,
  "Confidence":1,
  "ReviewForcedValidDescription":null,
  "ExtractionConfident":false,
  "Left":-1,
  "Top":-1,
  "Width":-1,
  "Height":-1,
  "PageIndex":-1,
  "DocumentFieldAlternatives":[
  {
    "__type":"FieldAlternative2:http://www.kofax.com/agility/services/sdk",
    "PageIndex":-1,
    "Confidence":1,
    "Text":"9995 0920 0921 2014",
    "Height":-1,
    "Left":-1,
    "Top":-1,
    "Width":-1
  }],
  "TableCells":[]
},
{
```

```
"__type":"RuntimeField3:http://www.kofax.com/agility/services/sdk",
"Id":"B85E7D31AB214BAD8788695739C3414D",
"TableRow":-1,
"TableColumn":-1,
"Value":"07/20",
"Name":"ExpirationDate",
"Valid":true,
"ErrorDescription":null,
"ReviewForcedValid":false,
"Verified":false,
"Confidence":1,
"ReviewForcedValidDescription":null,
"ExtractionConfident":false,
"Left":-1,
"Top":-1,
"Width":-1,
"Height":-1,
"PageIndex":-1,
"DocumentFieldAlternatives":[
{
  "__type":"FieldAlternative2:http://www.kofax.com/agility/services/sdk",
  "PageIndex":-1,
  "Confidence":1,
  "Text":"07/20",
  "Height":-1,
  "Left":-1,
  "Top":-1,
  "Width":-1
}],
"TableCells":[]
},
{
  "__type":"RuntimeField3:http://www.kofax.com/agility/services/sdk",
  "Id":"DE20E0217F8140C8AEBB1EAB74E1FD67",
  "TableRow":-1,
  "TableColumn":-1,
  "Value":"Visa",
  "Name":"CardNetwork",
  "Valid":true,
  "ErrorDescription":null,
  "ReviewForcedValid":false,
  "Verified":false,
  "Confidence":1,
  "ReviewForcedValidDescription":null,
  "ExtractionConfident":false,
  "Left":-1,
  "Top":-1,
  "Width":-1,
  "Height":-1,
  "PageIndex":-1,
  "DocumentFieldAlternatives":[
  {
    "__type":"FieldAlternative2:http://www.kofax.com/agility/services/sdk",
    "PageIndex":-1,
    "Confidence":1,
    "Text":"Visa",
    "Height":-1,
    "Left":-1,
    "Top":-1,
    "Width":-1
  }],
  "TableCells":[]
},
{
```

```
"__type":"RuntimeField3:http://www.kofax.com/agility/services/sdk",
"Id":"B2026001999D44089FEB7D4D0D4920C5",
"TableRow":-1,
"TableColumn":-1,
"Value":null,
"Name":"CardExpired",
"Valid":true,
"ErrorDescription":null,
"ReviewForcedValid":false,
"Verified":false,
"Confidence":1,
"ReviewForcedValidDescription":null,
"ExtractionConfident":false,
"Left":-1,
"Top":-1,
"Width":-1,
"Height":-1,
"PageIndex":-1,
"DocumentFieldAlternatives":[],
"TableCells":[]
},
{
  "__type":"RuntimeField3:http://www.kofax.com/agility/services/sdk",
  "Id":"22A4F17019F349C69735C4AEF30B8E4D",
  "TableRow":-1,
  "TableColumn":-1,
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  "Confidence":1,
  "ReviewForcedValidDescription":null,
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  ],
  "TableCells":[]
},
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  "TableRow":-1,
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  "Name":"LastName",
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  "ErrorDescription":null,
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  "Value":null,
  "Name":"MiddleInitial",
  "Valid":false,
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  "PageTextOcrs": [],
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