How to

Turn Business Cards into Salesforce Leads or Contacts

FullContact

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Travis is a Co-Founder at FullContact. He leads the product team responsible for technical, tactical and business direction of FullContact's suite of products.

Travis was instrumental in the design and leadership of the development of the FullContact Card Reader iOS application as well as the FullContact Card Reader API. He has maintained a very active role in continuing the development and progress of both products.

Travis is a 2006 graduate of the University of Texas at Austin, where he received a Master of Business Administration with an emphasis on entrepreneurship from the McCombs School of Business full-time program. He also holds a Bachelor of Science in Mechanical Engineering from the University of Wyoming.

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Executive Summary

Entering business card data into Salesforce is tedious and prone to error. FullContact Card Reader provides a better solution, and one that is available from your iPhone.

Simply snap a photo of a business card and submit it via the Card Reader app. Then move on to more important things.

While there are a few options to automate the process of converting a physical business card to a Salesforce Lead, there is a drastic difference in data quality when comparing OCR-based systems with human transcription. To assist your decision, we conducted a competition of some of the more popular business card reader apps available on iPhone. The results speak for themselves.
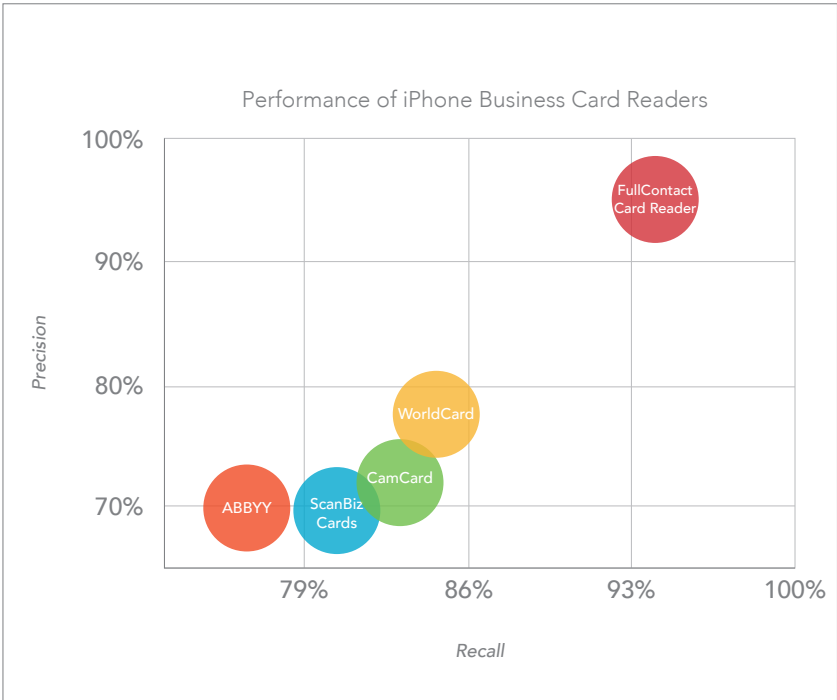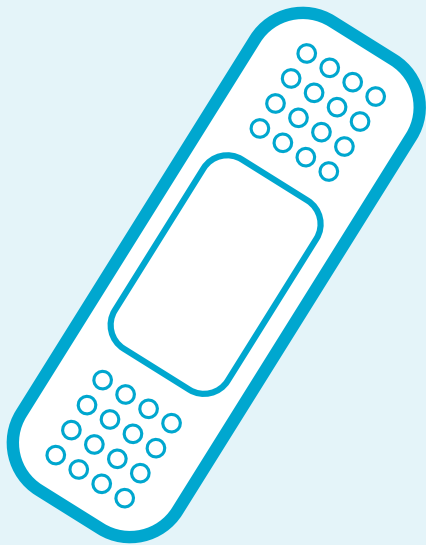

Figure 1. Performance of iPhone Business Card Readers

FullContact also utilizes Salesforce recommended processes for integrating with Force.com, ensuring a high level of security for your data. All transactions will appear on your behalf, ensuring that the Lead is ready for you when you need it.

The Pain of Transcribing Business Cards

Does the thought of sitting down at your laptop and punching 50 business cards into Salesforce by hand make you break out into a cold sweat? It should, I've timed it and it's an hour and thiry minutes of your life that you will never get back.

The good news is that there is a highly accurate alternative that automatically creates Salesforce Leads or Contacts from business cards on your behalf.

FullContact Card Reader is an iPhone app available on the iTunes App Store that allows you to snap a photo of a business card and then sit back and wait for it to be transcribed and entered into Salesforce for you.

You will *dedicate less than 25 seconds* per card, it's that easy.

There are a number of apps and devices on the market that promise to seamlessly take a business card and place it in Salesforce for you. FullContact Card Reader is different, and accuracy matters. In quality management there is the 1-10-100 rule, which simply argues that spending one dollar on accurate data now, will save you 10 dollars if you have to correct it later and 100 dollars if you do nothing about it in the form of lost opportunity and wasted cycles.
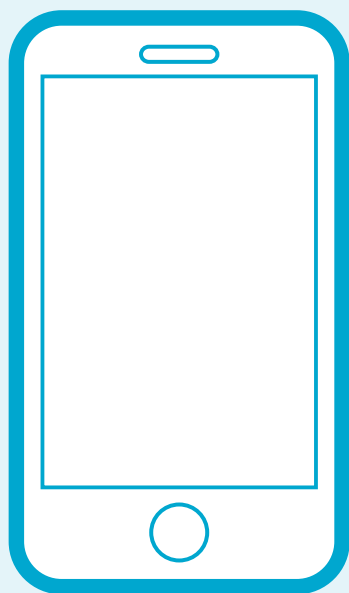
Get FullContact Card Reader from the App Store

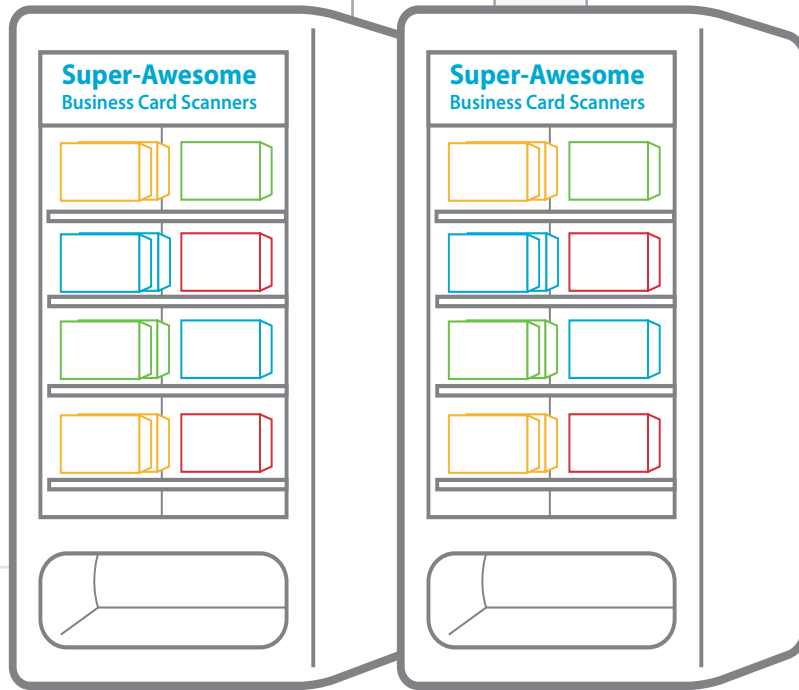In the next few pages, we'll discuss:

- FullContact Card Reader's approach

- The pros and cons of competing Business Card Reader Apps

- FullContact Card Reader's secure integration with Salesforce's Force.com

- Privacy of your data.

Your iPhone is the Best Scanner Out There

Have you ever had a long layover in the airport, a stack of business cards in your pocket, and the urge to purchase one of those fancy business card scanners from an overpriced kiosk?

We've all been there. Just turn around and walk away. The best device for scanning business cards is probably already in your pocket.

Your iPhone is compact, has a high quality digital camera, and doesn't require you to drag out your computer and USB cord. Additionally, the iPhone has an app store with a number of options for third party software that can be used to transcribe business cards. These apps usually have frequent updates that improve the quality and experience for the user. On the other hand, the software that comes with the various packaged scanners on the market usually have few if any updates after being shipped.

Next, we'll describe the technology involved, as well as the pros and cons of each approach.
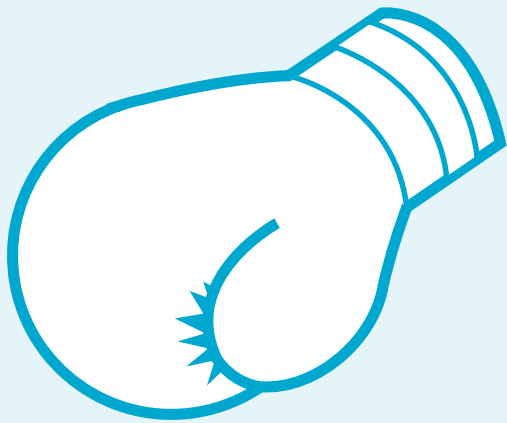
OCR vs. Human Transcription

When it comes to transcribing business cards, there are only two different technologies available: software based solutions and human based solutions.

Optical Character Recognition (Software Based)

Optical Character Recognition (OCR) is a computer science term for the translation of printed characters on physical medium to a form of characters that a computer can handle. Almost all business card scanning devices use optical scanners and OCR software. OCR dates back decades and works well in applications where the text is of consistent font type, size, and structure.

OCR's historical advantages were speed of processing and price of transcription, as well as the relative ease of dropping in support for different languages. The major disadvantage, however, is poor quality of transcription. Business cards are as much a work of art as they are a medium for exchanging contact data. The creative designs of many business cards lend poorly to OCR transcription, which often misses or incorrectly transcribes the text.

Advantages	Disadvantages
Processing time to results	Accuracy of transcriptions
Price per transcription	–
Languange support	–

Human Transcription

At FullContact, we've developed the FullContact Card Reader app that allows you to quickly take a picture of a business card, have it transcribed by a human, and then automatically input into your Salesforce account as a Lead or Contact.

Traditionally, human transcription was considerably more expensive than OCR transcription. We built our app in such a way that the price of transcription is now more competitive with OCR. The end result is an app with most of the advantages of both OCR and human transcription.

Advantages	Disadvantages
Accuracy of transcriptions	Processing time to results
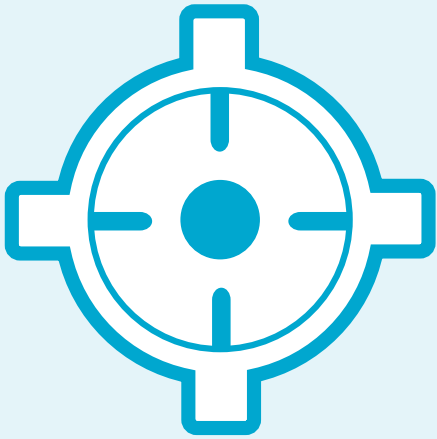
Putting Accuracy to the Test:
FullContact Card Reader vs. OCR Apps

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To answer the question of whether OCR or Human Transcription is better, we conducted a head to head test. We captured a quality image of 50 different US-based business cards and processed each image a number of times using the top iPhone business card readers on the market. The results show a clear difference in quality.

Table 1. iPhone Business Card Readers Tested

iPhone App	Technology	Version	Salesforce Integration
FullContact Card Reader	Human Transcription	1.1	Yes
ScanBizCards (premium verison)	OCR	3.2.1	Yes
ABBYY Business Card Reader (premium version)	OCR	5.2	Yes
CamCard (premium version)	OCR	4.0.0	No
WorldCard (premium version)	OCR	5.3.5	No

Methodology

We took a high quality image of each of 50 different US-based business cards. It is important to note that the same image was used in each application's test so that differing image quality wasn't a factor in the results. We then transcribed each of the 50 business cards so that we had a truth set as to compare the

transcriptions from each of the apps.

The 50 images were then separately run through the 5 applications listed above in Table 1. Each field returned was captured (i.e. first name, last name, email address, company name, etc.), resulting in 537 fields captured - or approximately 10.7 fields per card on average.

The results were then normalized where necessary. A few of the common examples of normalization completed include:

Phone Number Formats	(303)555-1234, 303.555.1234, 303-555-1234, etc. were normalized to be equivalent
URL Formats	http://fullcontact.com and www.fullcontact.com were normalized to be equivalent
Address Formats	Street addresses such as "123 Main Street | Suite 1" and "123 Main St., Suite 1" were normalized to be equivalent. State was normalized to correct for name versus postal abbreviation (CO vs. Colorado)
Casing	For the purpose of this study, the impact of casing was ignored. Thus "Travis" and "travis" were treated as equivalent

The field level results for each app were then compared to the known truth data for each card. Four categories were used to define each field level result:

- True Positive - Correctly identified. The application returned a value for the field and it matched the truth value that was present.

- False Positive - Incorrectly identified. The application returned a value for the field and it did not match the truth value.

- True Negative - Correctly rejected. The application did not return a value for the field, which matched the truth data that had no value for the field.

- False Negative - Incorrectly rejected. The application did not return a value for the field. The truth data did have a value for the field.

Finally the concept of *relevance* was applied using the measures of *precision and recall*.

- Precision is the ability to retrieve the most precise results. Higher precision means better relevance and more precise results, but may imply fewer results returned. Results range from 0 to 1 with a 1 being a perfect result.

- Recall means the ability to retrieve as many results as possible that match or are related to the information being retrieved. Results range from 0 to 1 with a 1 being a perfect result.

The results of the study are displayed graphically on the next page in Figure 1. A full table of results is available in Appendix A.
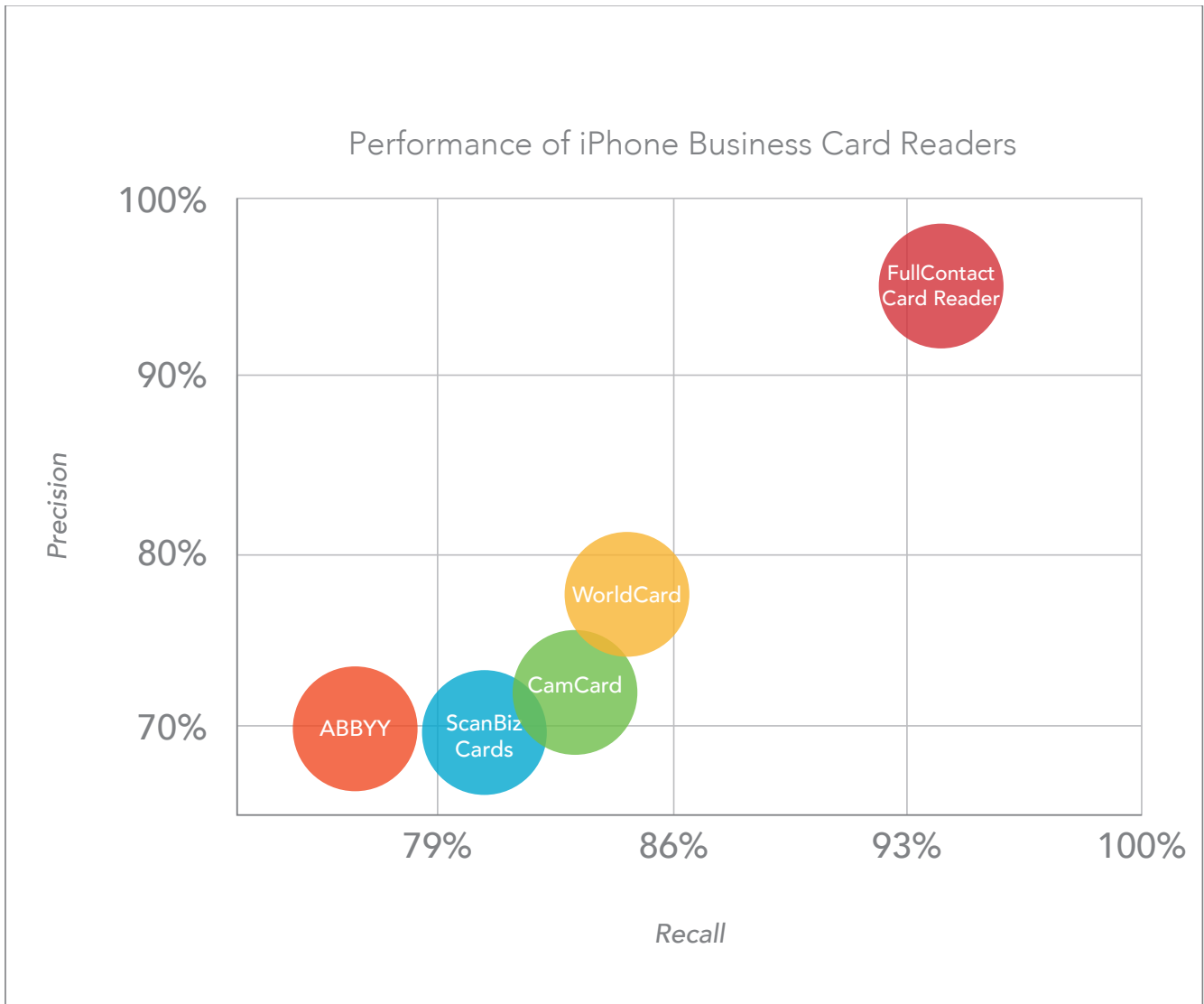
Figure 1. Performance of iPhone Business Card Readers

As is obvious, there is a drastic difference when comparing FullContact Card Reader with other business card reader devices on the market.

But what does this all mean?

Let's assume the average business card has 10 data elements on it, which was approximately what our business cards averaged. Take an example business card that has first name, last name, title, company, email address, street address, city, state, postal code, and mobile phone. Now let's say I'm using the app that has a recall of 80% and a precision of 70%. Crudely approximated, 14% of the business card didn't get transcribed, or in our example 1.4 fields were left empty when there actually were values for those fields on the card. Likewise, 26% of the business card values that did get transcribed (8.6 fields) got transcribed improperly, or in our example 2.6 fields had bad data in it. So in total, 40% or 4 of the 10 fields on the card were either omitted or had incorrect data.

For an App with a recall of 80% and precision of 70%, on average, 40% of the business card was improperly transcribed through omission and bad data.

Digging a little deeper, let's examine the accuracy of the results utilizing the statistical F Score which takes into account both precision and recall in an evenly weighted manner.

Like precision and recall, the F Score ranges from 0 to 1, with 1 being a perfect score.

While the average business card had 10.7 fields on it, lets take a look at the results in the form of comparing F Score for some of the more important fields on the business card, specifically the first name, last name, email address, company, title, mobile phone, and address fields. Figure 2 below shows a side by side comparison of each app's F Score for the fields mentioned above.

Figure 2. Side by Side Comparison of F Score for Certain Business Card Fields

First Name

- FullContact Card Reader
- WorldCard
- CamCard
- ScanBizCards
- ABBYY

Last Name

- FullContact Card Reader
- WorldCard
- CamCard
- ScanBizCards
- ABBYY

Company

- FullContact Card Reader
- WorldCard
- CamCard
- ScanBizCards
- ABBYY

Title

- FullContact Card Reader
- WorldCard
- CamCard
- ScanBizCards
- ABBYY

Email Address

FullContact Card Reader | WorldCard | CamCard
ScanBizCards | ABBYY

Mobile Phone

FullContact Card Reader | WorldCard | CamCard
ScanBizCards | ABBYY

If your use case is one where immediate results aren't required but accuracy of results is the big driver, then FullContact Card Reader is clearly your best option.

Getting Your Data Into Salesforce

When you install FullContact Card Reader, you first authenticate your Salesforce account via a process called OAuth (Open Authorization, described in further detail below). After transcription, the structured contact data is securely added as a Lead or Contact to your Salesforce account via the Force.com REST API. This process has the benefit of allowing FullContact Card Reader to input data into your Salesforce account without you revealing your password or other credentials to the app.

Authentication to Salesforce

OAuth is an open protocol which allows secure API authorization in a simple and standardized way for web-based applications like FullContact Card Reader. The Force.com platform implements the OAuth 2.0 Authorization Framework, so users can authorize applications to access Force.com resources on their behalf without revealing their passwords or other credentials to applications.

For a detailed understanding of how OAuth works with your instance of Salesforce, please visit the following resource: http://wiki.developerforce.com/page/Digging_Deeper_into_OAuth_2.0_on_Force.com.

As part of authenticating via the OAuth process, you will be asked to authorize FullContact Card Reader access to various resources. Those resources include:

- Access your basic information

- Access and manage your data

- Perform requests on your behalf at any time

This is all required so that FullContact Card Reader can input new Leads or Contacts into Salesforce from your business cards. We won't do anything else to your Salesforce account.

Your Business Card Data is Yours

At FullContact, we take your privacy very seriously, so you need not worry about how we handle the data from your business cards. Below is the FullContact Privacy Summary.

FullContact Privacy Summary

- Your Trust is of the Utmost Importance To Us, and We Will Never Betray It.

- Your Contact Data and Your Contact Record is Yours

- Your Private Data is Private

- Your Data is Protected

- Your Data is Portable

We highly recommend you read our entire Privacy Summary and Privacy Policy for a complete look into how your data will be treated and handled.

FullContact Information Management System

FullContact believes that information security rests as a cornerstone of our organization, and that a foundation of our business should include compliance with the ISO 27001 initiative.

The ISO 27001 standard specifies the management of Information Security. Applicable to all sectors of industry and commerce, it is not confined just to information held on electronic systems, but addresses the security of information in whatever form it is held.

Information is now globally accepted as being a vital asset for most organizations and businesses. As such, the confidentiality, integrity, and availability of vital corporate and customer information may be essential to maintain competitive edge, cash-flow, profitability, legal compliance and commercial image. ISO 27001 is intended to assist with this task.

Get Started With FullContact Card Reader Today

Entering business card data into Salesforce is a tedious process and prone to error. FullContact Card Reader provides a better solution, and one that is available from your iPhone.

Simply snap a photo of a business card and submit it via the FullContact Card Reader app. Then move on to other things that matter.

FullContact will utilize highly accurate human transcription to structure the contact data and write it to Salesforce on your behalf. On a long flight with no wifi, we've still got you covered. FullContact Card Reader has an offline mode that will queue up your photos until connectivity returns.

While there are a few options to automate the process of taking a business card to a Salesforce Lead or Contact, we have demonstrated the drastic difference in quality of data when comparing OCR based systems with human transcription. And why carry another device with you when your iPhone is already at your side as
you travel.

FullContact utilizes Salesforce recommended processes for integrating with the Force.com platform, ensuring a high level of security for your data.
All transaction will appear on your behalf ensuring that the Lead or Contact is ready for you when you need it.

Get FullContact Card Reader
from the App Store

Who is FullContact & What Do We Do?

Our mission is to solve the world's contact information problem. As we like to say, "If you've got an address book, you've got an address book problem." Most people have duplicate contacts, partial records, and out of date records . . . and they're scattered everywhere! It's a mess.

Businesses have the same problem, but it's actually worse for them because they have multiple employees, CRMs, marketing automation systems, billing platforms, help desk applications, and other cloud services.

As Dropbox did for files and Evernote did for notes, FullContact is doing for contacts. And we're providing it to individuals, businesses, and developers.

To learn more about FullContact, visit us at: fullcontact.com

Appendix A

Table 2. Field Level Precision, Recall and F Score of Business Card Reader Bake Off

iPhone Application	Precision	Recall	F Score
FullContact Card Reader	95.1%	94.0%	94.5%
ScanBizCards (premium version)	69.6%	80.4%	74.6%
ABBYY Business Card Reader (premium version)	69.9%	76.6%	73.1%
CamCard (premium version)	72.5%	83.1%	77.4%
WorldCard (premium version)	77.5%	84.7%	80.9%

Note: All cards used were for US based individuals. Images were high quality, taken with an 8 megapixel iPhone 5 camera with good lighting conditions.

Appendix B

Table 3. Element Level Precision, Recall and F Score of Business Card Reader Bake Off

Card Reader	Given Name	Middle Name	Family Name	Company	Title	Email	Website	Twitter Handle	Skype	Address 1	Address 2	City	State/ Region	Postal Code	Phone - Direct/Office	Phone - Main	Phone - Mobile	Phone - Fax	Total
Precision:	0.96	0.67	0.96	0.88	0.91	1.00	1.00	1.00	1.00	0.93	0.75	1.00	1.00	1.00	0.89	0.00	1.00	1.00	0.951
Recall:	1.00	0.80	1.00	0.98	0.98	0.98	1.00	0.80	1.00	0.85	1.00	0.89	0.89	0.91	0.98	0.00	0.91	0.90	0.940
F Score:	0.98	0.73	0.98	0.92	0.94	0.99	1.00	0.89	1.00	0.86	0.94	0.94	0.96	0.93			0.95	0.95	0.945
ScanBizCards (premium)																			
Precision:	0.67	1.00	0.76	0.52	0.59	0.78	0.62			0.47	0.29	0.83	0.90	0.97	0.85	0.38	0.70	0.88	0.696
Recall:	0.94	0.50	0.90	0.89	0.77	0.69	0.75	0.00	0.00	0.94	1.00	0.75	0.79	0.82	0.95	1.00	0.78	0.79	0.804
F:	0.78	0.67	0.82	0.66	0.67	0.73	0.68			0.63	0.44	0.79	0.84	0.89	0.90	0.55	0.74	0.83	0.746
ABBYY Business Card Reader (premium)																			
Precision:	0.77	0.83	0.85	0.39	0.76	0.64	0.67			0.45	1.00	0.85	0.95	0.63	0.80	0.38	0.95	0.94	0.699
Recall:	0.95	0.83	0.93	0.95	0.76	0.77	0.43	0.00	0.00	0.88	0.33	0.67	0.58	0.79	0.90	0.75	0.80	0.80	0.766
F:	0.85	0.83	0.89	0.55	0.76	0.70	0.52			0.60	0.50	0.75	0.72	0.70	0.85	0.50	0.90	0.86	0.731
CamCard (premium)																			
Precision:	0.71	0.80	0.88	0.34	0.71	0.70	0.79			0.65	0.67	0.94	1.00	0.97	0.73	0.21	0.82	0.88	0.725
Recall:	0.94	0.80	0.98	0.46	0.77	0.92	0.79	0.00	0.00	0.96	0.67	0.86	0.92	0.91	0.89	0.75	0.74	0.79	0.831
F:	0.81	0.80	0.92	0.39	0.74	0.80	0.79			0.77	0.67	0.90	0.96	0.94	0.80	0.33	0.78	0.83	0.774
WorldCard (premium)																			
Precision:	0.83	0.67	0.92	0.38	0.67	0.72	0.73			0.65	1.00	0.97	1.00	0.97	0.85	0.27	0.88	0.95	0.775
Recall:	0.95	0.40	0.96	0.86	0.63	0.89	0.57	0.00	0.00	0.96	0.67	0.83	0.95	1.00	0.98	0.75	0.75	0.95	0.847
F:	0.89	0.50	0.94	0.53	0.65	0.80	0.64			0.77	0.80	0.90	0.97	0.99	0.91	0.40	0.81	0.95	0.809