

VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ

BRNO UNIVERSITY OF TECHNOLOGY

FAKULTA INFORMAČNÍCH TECHNOLOGIÍ
ÚSTAV POČÍTAČOVÉ GRAFIKY A MULTIMÉDIÍ

FACULTY OF INFORMATION TECHNOLOGY
DEPARTMENT OF COMPUTER GRAPHICS AND MULTIMEDIA

ONLINE BUSINESS CARDS GENERATOR

BAKALÁŘSKÁ PRÁCE

BACHELOR'S THESIS

AUTOR PRÁCE

AUTHOR

MATÚŠ TURIC

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Abstrakt

Vizitky jsou stále nedílnou součástí marketingu. Vizitka představuje snadný způsob výměny základních kontaktních informací mezi jednotlivci. Tato bakalářská práce se zabývá popisem a tvorbou webové aplikace, pomocí níž si bude každý moci vytvořit vlastní vizitku podle předem připravených šablon. Výsledkem webové aplikace je PDF soubor s vytvořenými vizitkami.

Abstract

Business cards are still an integral part of marketing. Business card represent an easy way to exchange basic contact information between individuals. This thesis deals with the design and creation of a web application, through which anyone will be able to create his own business card from already prepared templates. The result of web application is a PDF file with created business cards.

Klíčová slova

Vizitka, generátor, webová aplikace, byznys, PDF formát, grafika.

Keywords

Business card, generator, web application, business, PDF format, graphics.

Citace

Matúš Turic: Online Business Cards Generator, bakalářská práce, Brno, FIT VUT v Brně, 2015

Online Business Cards Generator

Prohlášení

Prohlašuji, že jsem tuto bakalářskou práci vypracoval samostatně pod vedením pana Ing. Michala Seemana, Ph.D. Uvedl jsem všechny literární prameny a publikace, ze kterých jsem čerpal.

.....
Matůš Turic
May 15, 2015

Poděkování

Chtěl bych poděkovat svému vedoucímu práce Ing. Michalu Seemanovi, Ph.D. za jeho cenné návrhy, odborné rady a připomínky.

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Tato práce vznikla jako školní dílo na Vysokém učení technickém v Brně, Fakultě informačních technologií. Práce je chráněna autorským zákonem a její užití bez udělení oprávnění autorem je nezákonné, s výjimkou zákonem definovaných případů.

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Chapter 1

Introduction

Business cards are like a handshake. They are an integral part of the business communication and help us in creating a good first impression. The first impression is important in making new business partners and advertising the company or individual. Business card stores basic information about its wearer, it is easily portable, and it can be anytime at disposal.

The content is the first important part. The business card stores important information, which is needed in order to contact the owner of the business card. It consist of the name, the address, the phone number, the e-mail and the website.

The second important and today probably most important part is the design. Business card represents its bearer. Therefore, most individuals and companies, in an effort to differentiate itself, ceases to use conventional paper business cards and replaces them with other materials such as wood, plastic or metal. It is one of the fastest ways to get into people's consciousness.

The purpose of this thesis is to describe business cards, their history and variations, programs for their creation, and created application for making business cards.

The chapter 2 focuses on the brief history of business cards. This chapter also covers the basic typographic principles and the use of appropriate colors in the design.

The chapter 3 deals with analysis of both online and offline existing software for making business cards. This chapter deals with the differences between various software solutions, their advantages and disadvantages.

The chapter 4 contains a visual application page. This chapter explains the different parts of the graphical interface as well as used elements.

The chapter 5 describes the steps for implementation. This chapter also includes an explanation of used programming languages and libraries.

The last two chapters represent testing, evaluation (chapter 6) and conclusion (chapter 7).

Chapter 2

A centuries long tradition

2.1 Brief History

If someone thinks that the business cards were with us since 80s, then he or she would have been terribly mistaken. Business cards have been in use for many centuries. The origin of the business card can be traced back to China to 15th century. In that time, they represented a formal announcement spread among local population to inform of royal visit.[\[32\]](#)

In Europe, the business cards started to spread in France in 17th century. They were also known as Visiting cards or Calling cards. The Visiting card looked like small piece of paper with name of the bearer printed on it. The Etiquette was also important. The footmen of higher class deliver these cards to butlers of their prospective hosts, introducing the arrival of their masters [\[17\]](#). The card had folded right corner and was hidden in envelope. If the card was returned in envelope, it meant host's rejection.

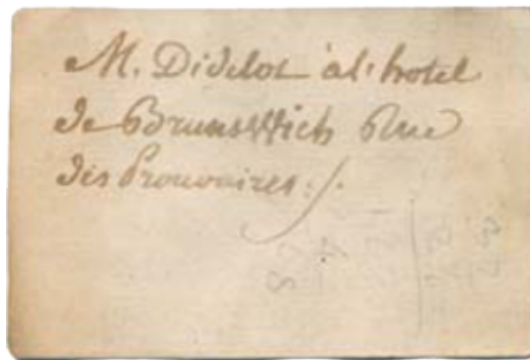


Figure 2.1: The example of visiting card from 18th century. [\[17\]](#)

In the 17th century in London, the Trade cards were created. These cards were distributed to potential customers and clients. The Trade cards had multiple uses. For the first time they were used as adverts. People also used them as invoices or as a map with directions.

In the middle of 19th century in France, Carte de visite were popular. It was a small card with a photograph on it and with information about the bearer below. These cards were soon replaced by Cabinet cards, which were larger and had details about photography

studio printed on back.

Nowadays, the business cards are internationally recognizable method of exchanging contact information. They are printed in almost any material, shape and color. Bearers are using various information like their Facebook, LinkedIn or their personal websites on their business cards. The possibilities of business cards are now endless.



Figure 2.2: The example of trade card from 1867. [35]



Figure 2.3: The example of modern business card. [41]

2.2 Typographic Principles

Although technology has advanced, the paper cards are still the most widely used forms of exchange of contact information in business sphere. Some people use the business cards for personal purposes, others for making business. Either way, the most important part of every business card is the design. The more distinguished and different they are, the better. But being unique also brings mistakes. According to the article published on site of American Marketing Association [40], these are the most common mistakes the user might be making:

- **Small font size**

Although a lot of people have perfect vision, making them read the letters and numbers with difficulty can only bring troubles. The right size is important.

- **Light font color**

Attention to the contrast is very important. If the business card uses a font that is too close to the color of the business card, it won't be readable. There is a chance that people with the business card like this will make an error or just give up.

- **Glossy paper**

One way of making card memorable is to have a varnish on top. The business card won't get as dirty over time, but it will also disallow to write on it.

- **Design inconsistent with website**

It is important to remember to have the card design that integrates the look and feel of used brand. The brand can gain more recognition this way.

- **No links to social media sites**

The business card should include links to the sites like Facebook or Twitter. People need to find the owner!

- **No email/web address or bad email**

It should be borne in mind that some people are too shy to communicate face to face. If the website is not available, use Facebook, Twitter or LinkedIn profile instead.

- **Printed on poor quality paper**

Trust isn't something that can be gained easily. Keep in mind that the business card is one of the first impression factors. People have to be interested in the brand.

- **Shares too much information**

Too much information is harmful. The Business card should guide people, inform them of provided services, not to teach them.

- **Includes no brand promise or tagline**

Clear and compelling brand promise is needed by every person, company or organization. They make the business card more interesting and memorable. Without a brand promise, the business card is simply a contact card.

- **Does not use back of card**

It is recommended to always use the back side of the business card. It is perfect place for the brand promise, QR code, calendar, or just a logo or picture.

To avoid these mistakes, remember to keep the business card design clean, simple and readable. Simple doesn't mean worse, in a lot of cases the simple designs are much better than more complex ones.

2.2.1 Dimensions

The dimensions of business cards [2] are not the same everywhere, they can differ from country to country. The following table 2.1 shows different sizes in different countries.

Country/Standard	Dimensions [mm]
ISO 216, A8 sized	74 x 52
Ireland, Italy, United Kingdom, France, Germany, Netherlands, Spain, Switzerland, Belgium	85 x 55
ISO/IEC 7810 ID-1, credit card sized	85.6 x 53.98
Australia, Denmark, New Zealand, Norway, Taiwan, Sweden, Vietnam	90 x 55
Japan	91 x 55
Hong Kong, China, Singapore	90 x 54
Canada, United States	88.9 x 50.8
Iran	85 x 48
Argentina, Brazil, Czech Republic, Finland, Hungary, Israel, Kazakhstan, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Ukraine, Uzbekistan, Bulgaria, Latvia, Mexico, South Africa	90 x 50

Table 2.1: Worldwide commonly used dimensions of business card

2.2.2 Parts of Business Card

Every business card should include the following core information [5]:

Name of the Individual

Putting a name on a business card gives the card a personalized touch. It helps when people are communicating with a company and they know a person they can reference to. It is one of the most prominent text elements of the business card.

Name of Business or Organization

In most countries, this is the most prominent text element. The name can remain as text or the logo with name of a company inside can be used.

Address

People need to find the owner! If the company has a physical place that people can visit, then it should be included in the business card.

Email Address

Nowadays, it is essential for every business card to include an email address.

Website Address

Another essential element of every business card. There is no need for `http://` preceding the URL, but it can be included.

Job Title

The job title helps to rise the credibility of the company or people. If something happens, the people will know, whom they should contact directly.

Description

A tagline or 1-2 sentence description can help to rise the awareness of the company. It reminds people of who the company is and what it does.

Logo

It represents the company. Using logo is a great way to make the brand more memorable.

Graphic Images

Adding graphic images as logo or background will make the card more unique.

Optional information

A list of services or products, calendar, QR codes, or a link to the social media profiles can be also included.

2.3 Etiquette

When doing business abroad it is important to understand the etiquette and culture of the country. Understanding the business etiquette allows the people to feel comfortable in their dealings with foreign clients.

In Europe or America the business card is just a tool for exchanging personal information and “breaking the ice”. The business card etiquette is more relaxed and involves a little ceremony [38]. It is good to keep in mind not to hand out worn, dirty or faded business cards unless it is intended for business to look worn, dirty and faded. The business cards should be neat and clean with the edges that are still sharp. It’s also crucial to wait at the appropriate time. Don’t try to hand out the business card when the prospect is busy or distracted by others.

On the other hand, in Japan the business card is something the people just must have [43]. It represents the owner and it should be treated with honor and respect. It is very important to note that in Japan the people have to always use both hands when accepting the business card. Always present the business card holding it with both hands, Japanese-language side facing forward, to the most senior member of the Japanese party first. Never write notes on a Japanese business card, fidget or play with it. It is considered utterly disrespectful.

2.4 Colors

When thinking about colors, it is good to keep in mind using the right combinations [4]. Complementary colors should be used as main and accent colors. They are really bad for text. These colors are opposite each other on the color wheel. For example blue and yellow.

Analogous colors are those colors, that share same undertones. They are found next each other on the color wheel. They are harmonious and pleasing to the eye.

Triads are used to create a dynamic color scheme. Triadic color harmonies tend to be quite vibrant. They can be formulated by picking a color on the color wheel and the fourth color thereafter. An typical example is violet-green-orange.

Split-Complementary Triads are used to create more muted color combination. These are the ones on either side of a chosen color’s opposite chrome on the color wheel. For example, for red-orange it is green-blue. The split-complimentary color scheme is often a good choice for beginners, because it is difficult to mess up.

2.4.1 The Character of Colors

For future dealings is good to know what is the character of each color [49].

Red

Red can be recognized as a stimulant due to the level of energy perceived. Red draws attention. This color is connected with strength, love, heat, aggression or passion.

Orange

Orange radiates warmth and energy. It is mainly connected with command and control.

Yellow

Yellow is a warm color represents optimism, enlightenment and happiness. It raises the creativity in mind, and may even revive a feeling of nostalgia.

Green

It can cause the body to feel soothed and relaxed. The green color can alleviate depression, nervousness, and anxiety, as well as offer a sense of renewal, self-control, and harmony.

Blue

Blue is the color of the spirit. It invokes rest and can calm the body. Blue can be serene, brilliant, and electric. It makes people feel safe and confident.

Purple

Purple embodies the balance of red stimulation and blue calm. Purple can be a spiritual color that calms the nerves as well as the mind. Just as yellow, purple can invoke creativity.

Brown

Brown is color of earth and it is associated with everything organic or natural. It makes people feel comfortable and stable, as well as healthful and orderly.

White

White projects purity, cleanliness, and neutrality. The color contains clarity and it helps people clear our thoughts. This color is mostly connected with peace.

Gray

Gray is a neutral, balanced color. It is considered conservative and evokes strong emotion. It also has a detached and isolated feeling. Gray can have a cooling effect when placed next to other more vibrant colors.

Black

Black is a color that is authoritative and powerful. It can evoke strong emotions. This color can make people feel inconspicuous, empty, and mysterious. It can also evoke a sense of potential and possibility.

2.5 Digital Business Cards

2.5.1 vCard

A standard format [51] for an electronic business card that includes fields for the description of people and organisations. It also includes fields for photos, sound and company logos.

It was originally developed by the Versit group, then later turned over to the Internet Mail Consortium (IMC) and then standardized by the IETF in 1998. It has not gained

universal acceptance, therefore the mail client like MS Outlook with support of vCard is needed. Attached vCard data can be inserted by using .vcf file extension. The vCard has been significantly updated in version 4.

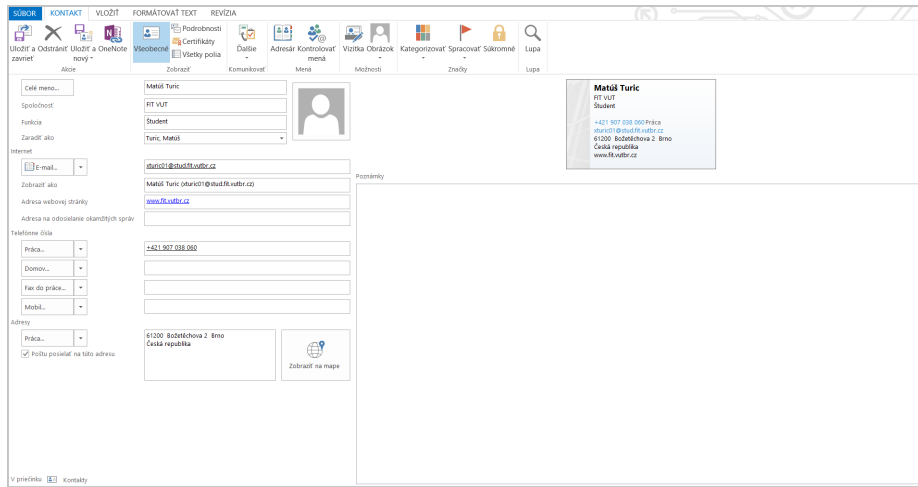


Figure 2.4: The example of MS Outlook. [29]

2.5.2 Bootable Business Card

Is a CD-ROM, that has been modified to the size and shape of a business card. The idea of this type of business card was proposed in 1999 by Linuxcare employees Duncan MacKinnon, Tom Crimi, and Seth David Schoen. The premiere version was available at the then-upcoming LinuxWorld Conference and Expo [26].

The cards are designed to fit in a wallet or pocket and hold about 50 MB. The CD business cards are mostly used for commercial product demos, they are mailed to prospective customers or they are handed out at the trade shows. The main advantage of this type of solution is the possibility to provide much more information than standard paper business card.



Figure 2.5: The example of Bootable business card. [?]

2.5.3 USB Business Card

It is a USB Flash drive in the size and shape of a business cards. The USB Business card is very similar to the Bootable business card. The versatility of this type of flash drive gives the wearer the option to take his files with him anywhere, without the hassle of keeping up with a traditional USB drive.

The main difference between CD and USB business cards is the size of a memory. The USB variation can hold much more data than its CD counterpart and it is rewriteable too. The USB version is also more practical.



Figure 2.6: The example of USB business card. [42]

2.5.4 Paper Business Card with NFC Chip Inside

It is basically standard paper business card, but inside is embedded a tiny NFC microchip [33]. When the business card is touched to a smartphone, the phone starts to do an activity programmed in the chip. It can be programmed to play music or video, download files, load web pages, maps or application - the possibilities of this type of solution are endless.

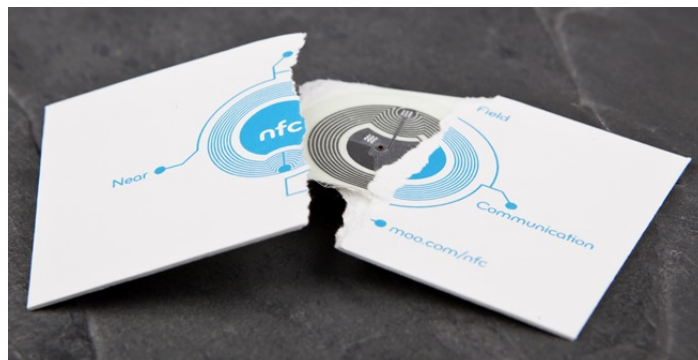


Figure 2.7: The example of paper business card with NFC chip inside. [33]

Chapter 3

Existing Software

3.1 Online Applications

3.1.1 DeGraeve

DeGraeve is very simple business cards generator [6]. Therefore, it offers only few options for designing the business card. People can upload image, but only one. The size of image can not be changed. The application has only ten input text fields. There is absolutely no possibility to add more. The font can't be changed and there are only three possible sizes of font: small, medium and large. Text can be set to bold or italic. No other text settings are supported. The application also lacks support of changing text color, and Czech or Slovak diacritics.

Changing the position of the elements is impossible. Text is on the right side and the image on the left. There is no action to edit the back side of the card and there is also zero chance to change background of the front side. Changing the card size is also not possible. It supports only the US standard listed in table 2.1. The output is generated in PDF format on paper in standard size („letter size“) with 12 business cards on page.

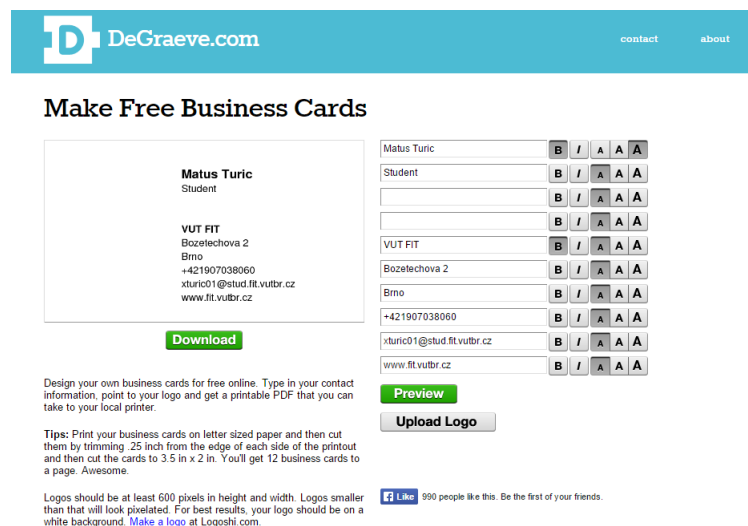


Figure 3.1: The example of DeGraeve's layout. [6]

3.1.2 Business Card Maker

Another web application for making business cards is Business Card Maker [1]. The application is user friendly and free with no registration included. This application also supports templates, but people can only choose one of already predefined templates. They can't upload their own template, nor change the color of template.

This application does not have input text boxes separated from card. They are editable directly in card. But boxes are linked with templates and it is impossible to create more than those that already exist, although this shortcoming was replaced by almost infinite possibility of writing into text boxes.

The application supports up to seven fonts in seven different sizes. Bold, italic and underline are also supported. People can upload images just by clicking on the image box, but only one is allowed. Business Card Maker has no issues with Czech or Slovak diacritics. It is also possible to change the position as well as the size of the elements. The output is generated in PDF format on paper in standard size („letter size“) with 10 business cards on page.

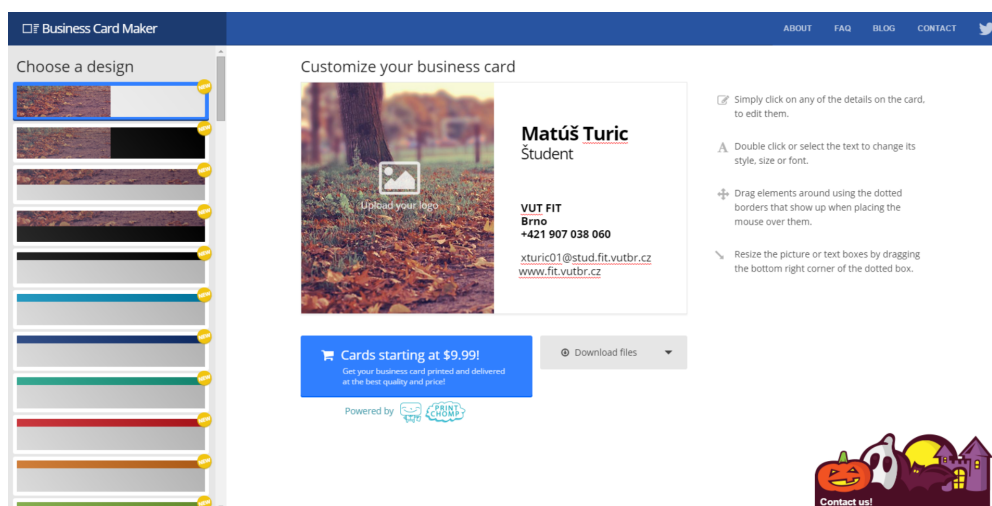


Figure 3.2: The example of Business Card Maker's layout. [1]

3.1.3 Jukebox

This web application [24] belongs to the richest business cards generators. It offers many possibilities of creating the business card. Firstly, the template has to be chosen. Then the user can finally create and edit his business card.

The content can not be changed in the card area. All changes are made via the side panel situated on the right side of the website. On the left side the user can choose which side he or she wants to edit. It is possible to choose different font type, font size and different color of font, but there is no such thing as bold, italic or underline. It is also possible to choose line height. The additional feature is to add shadow to the text element. The user can edit direction, distance and color of shadow.

The image upload is also available. The user can choose to upload image or select from predefined ones. However, the only supported formats are jpg, jpeg, png and gif. The user can add as many images as he or she wants and edit their scale. The other interesting

options are changing of the background color, adding multiple shapes and possibility to add QR codes into the card area. It is also allowed to change position and rotation of the elements.

In order to save the project for future editing, the user has to go through registration process. There is also a problem with card area, which is in some templates too big. The card area hides the editing panel, thus making the card edition harder and sometimes even impossible. On the bright side Jukebox has no issues with Czech or Slovak diacritics.

The output is generated in PDF format on paper in standard size („letter size“) with front side of business card on the first page and the back side on the second page.

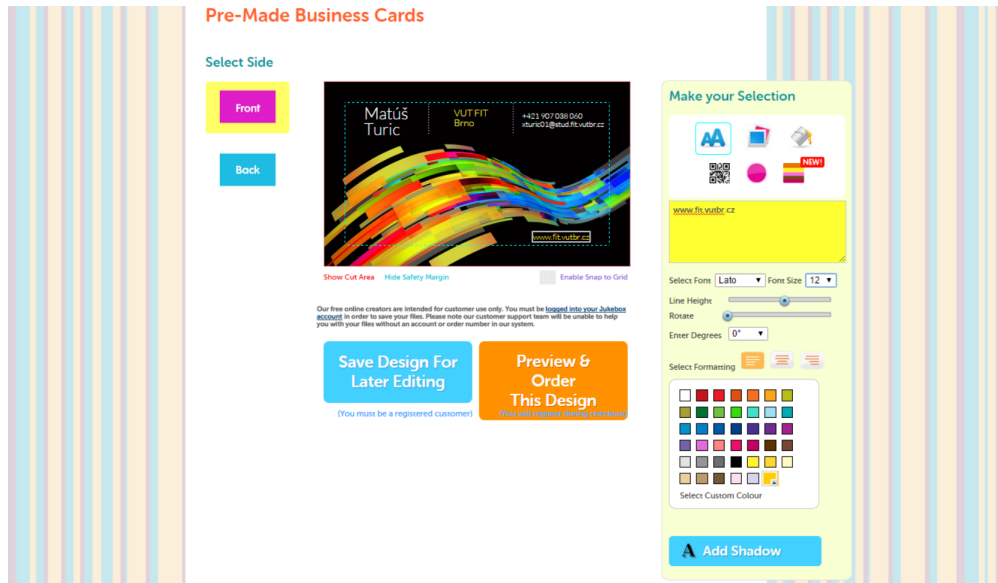


Figure 3.3: The example of Jukebox’s layout. [24]

3.1.4 Moo

Moo [31] is flash-based web application, which offers rich editing options of the business cards. Firstly, the users have to choose if they either want to edit predefined template or design their own. After this step the edition of business card can begin.

Input text boxes are not separated from the card area. Text has its own subarea and it is editable directly in that subarea. After clicking on text, the pop-up menu with options will show up. The users can choose different font type, font size, different color of font and alignment. Text can be set only to bold or italic. There is not underline option. The application shows warning messages, if there might be possible problems with Czech or Slovak diacritics in the printing process.

The users can upload many images, but only one of them can be used. The image has also his own subarea. In this subarea users can change the position, size and rotation of image. It is also possible to choose upload source. Supported sources are Facebook, Instagram, Flickr, Picasa, SmugMug, Etsy and the computer storage.

The users can’t change position of the elements as they want, but they can choose from different layout types. The application lacks the possibility of creating own color of background, but it is possible to choose from predefined ones. Among other interesting

options belong the option to add QR codes, but this option will replace uploaded logo. Nice feature is changing the corners of business card to round.

In order to save the project for future editing or even be able see generated PDF file, the users have to be registered. Not to mention that once they get the PDF file, they will not be able to print it anywhere but Moo, because of watermarks.

The output is generated on paper in standard size („letter size“) with both front and back side of business card on the first page.

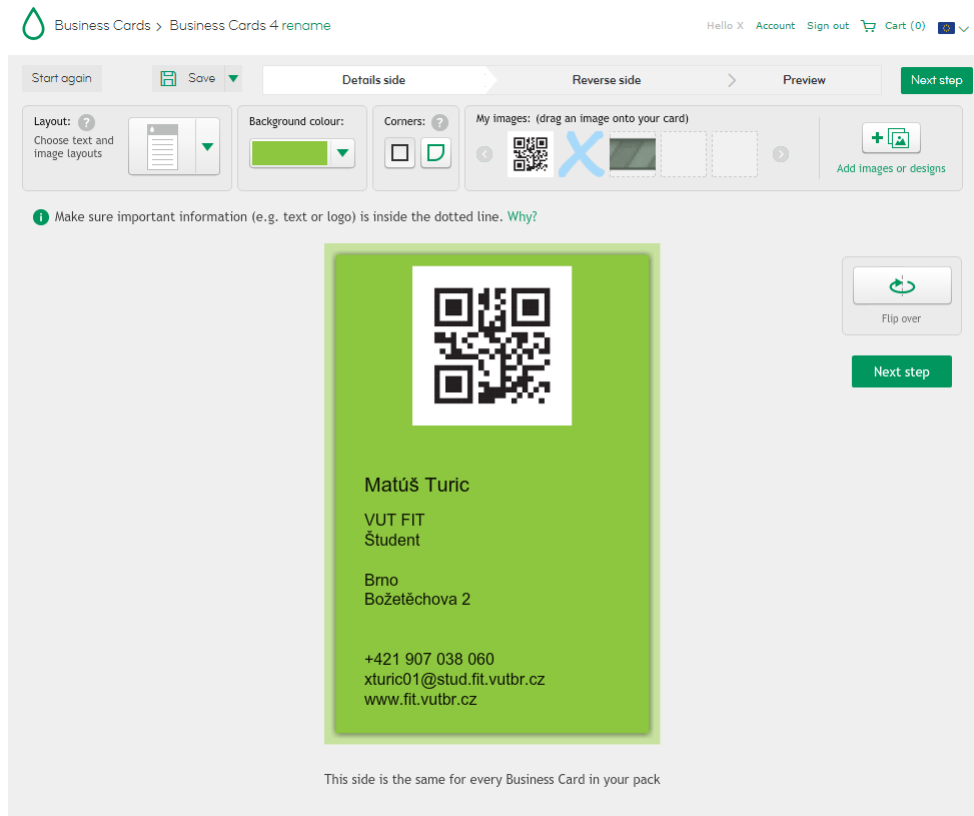


Figure 3.4: The example of Moo's layout. [31]

3.1.5 PsPrint

PSPrint [39] is a web application for creating business cards. It doesn't offer many creation possibilities. The first thing to do is to choose one of many available templates, then the user can edit parameters of business card.

The content can be changed in the card area or in the input boxes. It is possible to choose different font type, font size and different color of font. The application also supports bold, italic and underline effects. It is also possible to place the element anywhere.

The image upload is also available, but only one image can be used. Supported formats are eps, jpg, pdf, ps, psd and tif. The user can change the size and position of image. It is possible to use crop tool as well.

There is no need to be signed up in order to save the project. There is also a problem with card area. Sometimes the user has to click more times to get the right element. There

is also problem with diacritics. The text area has no problem with with Czech or Slovak diacritics, but the input boxes show different characters. On the bright side there is support of the back side editing.

The output is generated in PDF format on paper in business card size with front side of business card on the first page and the back side on the second page.

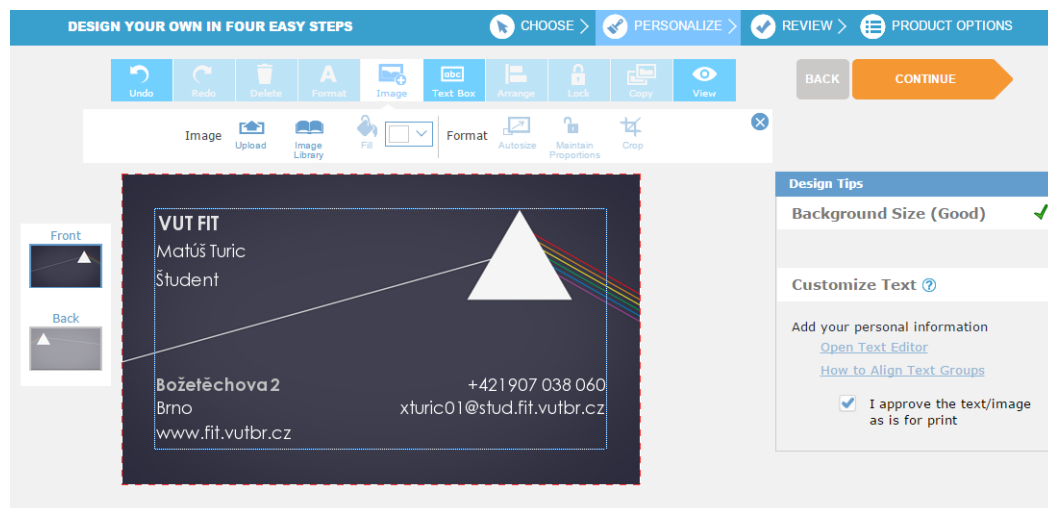


Figure 3.5: The example of PsPrint’s layout. [39]

3.2 Offline Applications

3.2.1 BusinessCards MX

The first of the offline business cards editors is BusinessCards MX [30]. The application offers simple and new looking user interface. The first step is to choose one of many available templates, which are logically divided into groups. The next step for the user is to take his or her fantasy and start building the business card.

The content can be changed in the card area or in the input boxes. There is a possibility to change font type, font size or color of font. The application supports bold, italic underline and strikethrough. The user can choose from high variety of effect like blur or sepia. The position can be easily changed by using mouse to drag the element.

The user can add as many images as is needed. Matter of course is changing size and position of image. The effects can be also added. The image can be also used as background.

The application supports adding the different shapes and lines. It also supports adding a calendar. In order to use full potential of application, the user needs to buy it. If the application remains as demo, the watermark will be added to the generated output file. There is no problem with Czech or Slovak diacritics

The output is exported in graphic format or in PDF format. The user has to choose which side of business card needs to be exported. Then he or she will choose either CMYK export or default DPI export. The output has size of one business card. There is also an option of direct printing. If this option is chosen, then the output is generated on paper in standard size with 10 business cards on page.

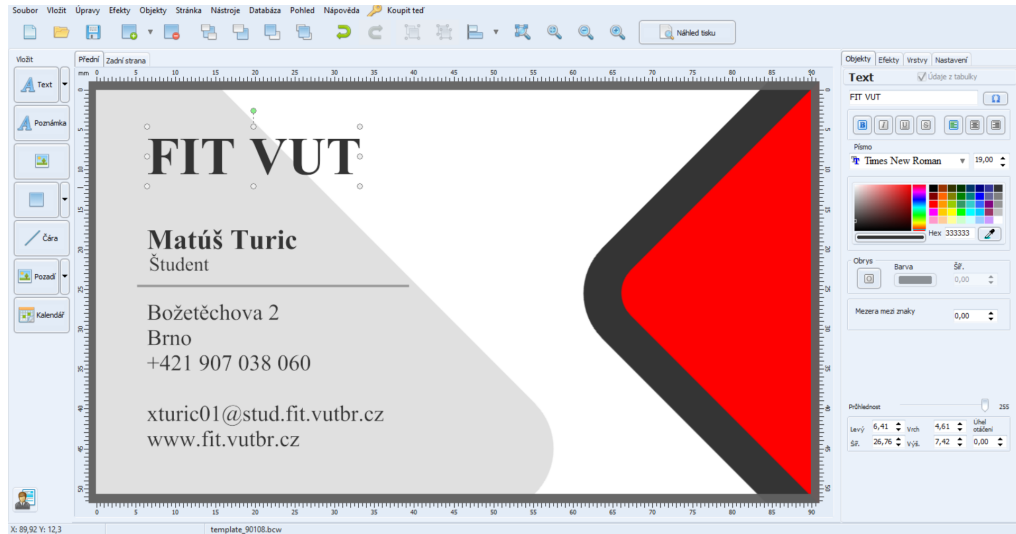


Figure 3.6: The example of BusinessCards MX's layout. [30]

3.2.2 Business Card Designer Plus

The second of the offline business cards editors is Business Card Designer Plus [3]. The application is represented by simple user interface. The first thing to do is to choose layout, then pick one of the many potential layouts which are categorized into groups. After this steps the user can finally start to edit his business card.

Changing the content in the card area is impossible, but it can be changed through the input boxes. The user can change type of font, font size or choose different font color. The application supports bold, italic, underline and even strikethrough. The effect like shadow or blur are also supported. The position can be easily changed by dragging mouse, but it doesn't show right position - little bit of imagination is needed.

The user can add as many images as he is willing to. The user can choose from predefined images or add his own. The position, size and rotation can be changed too.

The application supports adding the different shapes, lines and objects. It also supports adding bar codes, QR codes and gradient background. The application has to be bought, but 30-day trial version is available. While the application is in trial mode, the watermark will be printed on each design. There is no problem with Czech or Slovak diacritics.

The output can be generated in graphic format like png, jpeg, tiff or bmp, but only if the application is bought. Otherwise the user has to directly print his design.

3.2.3 CardWorks

The third offline editor is called CardWorks [34]. The application comes with simple user interface. At first, the user has to choose one of many available templates. There is also a possibility to download more.

The content can't be edited in the card area. It can be changed through the input boxes. The user can choose from different font types, font sizes or colors. The application supports bold and italic, but underline is not supported. The position can be easily changed to the desired area by dragging mouse.

The user can insert image, but only one image can be used as logo or background. The user can also modify the size and position of image. To unlock full capabilities, the application has to be bought. If the application remains free, the company logo will be printed on each business card. The biggest disadvantage in content is the unavailability to add new input boxes. There is at least no problem with Czech or Slovak diacritics.

The output is generated in PDF format. The user can change number of printed cards, cards per sheet or the paper type. It is also possible to set margins or gaps. The option of direct printing is available as well.

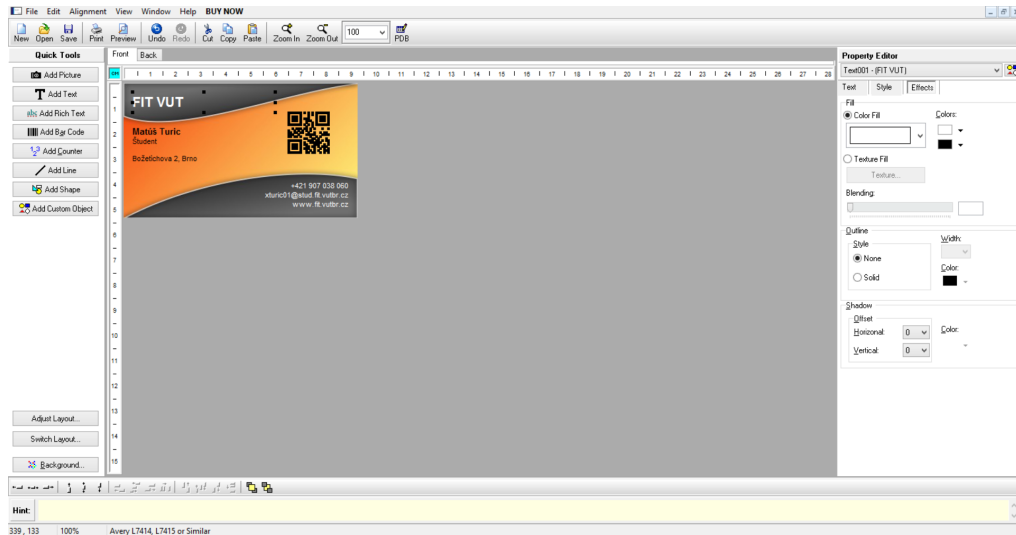


Figure 3.7: The example of Business Card Designer Plus's layout. [3]

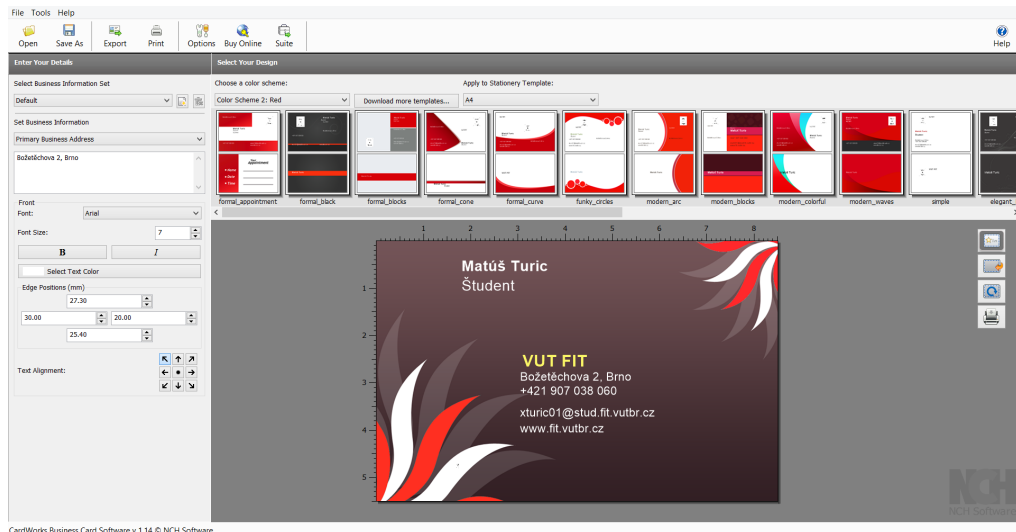


Figure 3.8: The example of CardWorks's layout. [34]

3.2.4 Business Card Studio

The last of the offline business cards editors is Business Card Studio [8]. The application offers pretty intuitive user interface. At the beginning, the user has to pick from a few available templates. Then he or she has to fill the input boxes.

The content can be changed only through input boxes on the side. If the application is under shareware licence, no further editation is possible. In the full version, the user can change font type, font size, style of font or choose different color of font. The position of elements can be easily changed to the desired area by dragging mouse.

The user can insert enough images and change their size and position. The program supports several formats, such as GIF, PNG, JPG, JPEG, BMP, ICO, EMG and WMF.

To unlock full capabilities, the application has to be bought. If the application is not upgraded to full version, then the functional limitations remain. The biggest disappointment is the look of created business card - everything looks very old. There is at least no problem with Czech or Slovak diacritics.

The output is directly printed on paper in standart size with maximum of 10 business cards on page. The user can also change the size of the page margins. The option of export to file is also at disposal, but only in full version of application.

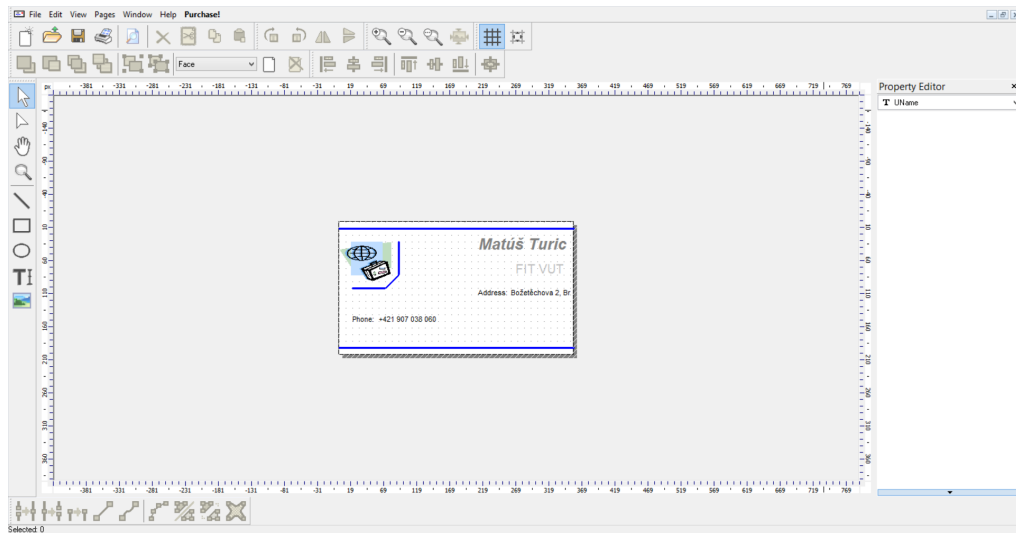


Figure 3.9: The example of Business Card Studio's layout. [8]

Chapter 4

The Visual side of Application

The user interface is the most important part of any computer system and its software. It is the system to most users, who can interact with it differently. They can see, hear, touch, talk to, or otherwise understand or direct it. The software code is invisible to their eyes, it's hidden behind screen, keyboard, voice or the mouse.

The goal of interface design is simple: to make interaction with a computer easier, more productive and enjoyable. It is good to have in mind this golden rule [50]:

A user interface is well-designed when the program behaves exactly how the user thought it would.

To help achieve this golden rule, there are some guiding principles [50]:

- **User familiarity:** Copy well-known features from other programs.
- **Consistency:** Do similar operations in the same way.
- **Choose default values carefully:** Minimise the number of choices novice user has to make.
- **Use metaphors:** To establish the user model.
- **Recoverability:** Ensure UNDO or REDO is working in every situation.
- **Provide help:** Make it sparing and highly context specific.

4.1 The Benefits of Good Design

There are a lot of benefits we can gain using proper design. The studies have shown that the use of the correct information formatting on screens has a significant impact on performance [12].

Cope and Uliano found out in 1995, that modernizing of one graphical window to be more effective, would save a company about \$20,000. Baca and Cassidy in 1999 redesigned an organization's homepage because of users complaints. The improvement in search success rate between the first and final redesign was about 15%, and the improvement in search time about 50%.

Identifying and resolving problems sooner - during the design and development phase has significant economic benefits. In 1992, the Pressman has shown that for every dollar

spent fixing a problem during product design, \$10 would be spent if the problem was fixed during development, and \$100 would be spent fixing it after the product's release. We can only imagine how much money might proper design save.

There are additional benefits that likewise result from good design. The cost of training is lowered because of training time reduction, the cost of support line is smaller because fewer calls are necessary, and employee satisfaction is increased thanks to frustration reduction.

4.2 Interaction Styles

The interaction styles [12] are part of GUI, which is dramatically different from his text-based predecessor. These Interaction styles are methods, by which the user and the computer communicate together. Today the designer can choose from several interaction styles.

Command Line

The command-line interface is the oldest and also the first user interaction style. The user needs to type lines of commands into an entry area on a screen, or press a function key.

Menu Selection

It is represented by a set of options or choices from which the user must choose. The choice is selected with a pointing device or keystroke. The visual feedback is used to indicate that the option was selected.

Form Fill-in

This style is very useful for information collection. Screens that use forms contain a series of controls or fields. The user either types information into these fields or selects an option from a listing of choices.

Direct Manipulation

Interface that enables the user to directly interact with elements on the screen. Elements and actions are selected by mouse or another pointing device. Through menu bars and pull-down menus, they can navigate the screen and execute commands.

Anthropomorphic

One of the hardest interfaces. To develop these kinds of interfaces the understanding of human behavior is required. This interface tries to interact with people the same way people interact with each other. It includes spoken natural language dialogues, hand gestures, facial expressions, and eye movements.

Style	Advantages	Disadvantages
Command line	Powerful and Flexible Good for expert users Screen space conservation	Commands memorization Learning required Possible typing errors
Menu selection	Utilizes recognition memory Reduces interaction complexity Good for casual users Minimizes typing Supports decision-making process	May slow knowledgeable users Large area coverage Possible complex menu hierarchies
Form fill-in	Minimal training required Format is familiar Simple information entry	Careful and efficient design required Large area coverage Unable to prevent typing errors
Direct manipulation	Faster to learn Easy to remember Provides context Immediate feedback Easy error recovery	Icon recognition required Greater design complexity Requires window manipulation Inefficient for touch typists Higher screen clutter chance
Anthropomorphic	Natural	Difficult to implement

Table 4.1: Interaction styles overview

4.3 Web Application Design

The Web interface revolutionized computing. Thanks to Web, millions of people can communicate together, access variety of information or publish their own ideas. The user is given a large amount of control. He or she can decide to turn off graphics, accept or refuse cookies, change typography, colors and more. Users care a lot about good design. Poor quality of design, confusing navigation, disturbing animations, or other unwanted features result in immediate abandonment of the site.

4.3.1 Web Interface vs GUI

A Web user interface is very similar to the GUI interface. Both are interactive, used by people and composed of similar components. However, some significant differences can be found. The table 4.2 below shows only a few differences, more differences can be found in the Guide to User Interface Design [12].

	GUI	Web
Devices	Limited hardware variations. Well defined hardware characteristics. Screens appear exactly as specified.	Enormous hardware variations. Screen appearance influenced by hardware.
User focus	Data and applications.	Information and navigation.
Data/Information	Used and created by known and trusted sources. Properties generally known. A notion of private and shared data exists.	Full of unknown content. Higher possibility of untrusted source. Privacy often suspect. Highly variable organization.
User tasks	Open, use, and close data files. Install, configure, personalize, start, use, and upgrade programs. Long times spent within an application. Possibility of familiarity with applications.	Rapid movement between pages and sites. Link to a site, browse or read pages, fill out forms, register for services, participate in transactions, download and save files. Unfamiliar with many sites.

Table 4.2: Differences between GUI and Web Interface

4.3.2 Used Elements for User Input

Any website would have been pretty much useless without user input. For processing user requirements, Form elements are used [46]. The table 4.3 below shows only elements used in my web application.

Element	Description	Usage in Application
Radio button	Used for selection from a limited number of choices. Can select only one option.	Size, Orientation and Corners of the business card. PDF Generation.
Submit button	Used for for submitting a form to the server.	Adding backgrounds and logos.
File	For uploading file to server. Additional server-side scripting is required.	Adding backgrounds and logos.
Select	Creates drop-down list.	Font type choosing.
Button	Defines a clickable button. Image or Text can be put inside.	Text Changing, Site navigation, trigger for QR code, Pdf generation.
Label	Defines a label for an input element.	Used in combination with radio buttons.

Table 4.3: Form elements overview

4.3.3 The Application

The Application was designed to resemble pretty much any off-line fullscreen editor. The GUI of Application is divided into five main areas.

First area is a navigation panel. The only option that can be found here is the language selector. User can choose his language preference through the drop-down menu. The navigation panel further contains logo and name of the application.

On the left is the second area. This area represents options related to the design of the business card. The user can choose from six main options. First two options behave as drop-down menus, the rest as buttons. The First option - card details, includes options for changing properties as size, orientation, background color and corner roundness of the business card. The second option - text details consist of several options used to change text properties. The user can modify size, style, type, color and alignment of text. Range slider is used for changing the size of text. The user can choose any size from 8px to 110px. The following styles are at his disposal: bold, italic, underline, strikethrough, subscript and superscript. The application supports over 170 different fonts imported from Google Fonts API [16]. The third option is used to add new text into the side zone. Under this option the fourth option can be found. This option behaves as previous one, but it adds image, instead of text. The fifth option generates QR code. By clicking on this option the modal window shall appear. Inside of this modal window the user can choose back and front color of the QR code and define the content of QR code. The PDF generation is done through the last option. By choosing this option the modal window appears. Here the user can choose paper type, number of business cards and margin. These options can be seen in figure 5.2.

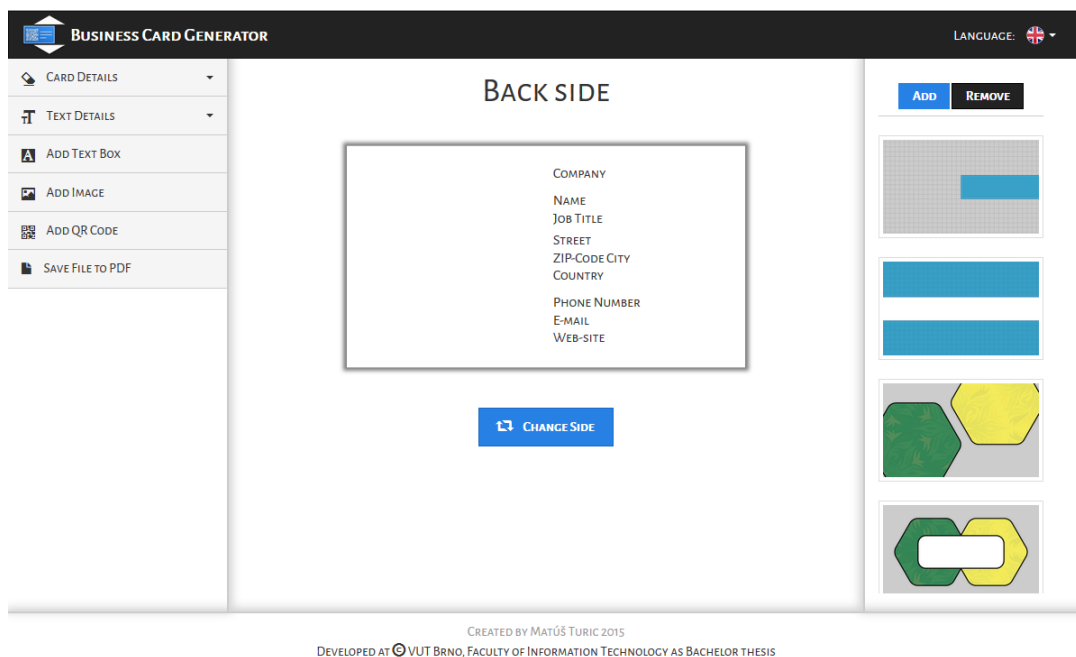


Figure 4.1: The visual Appearance of created Application.

In the middle is situated the third area - business card content area. This is the application's most important part. This area is composed of the current side zone of business

card, button used to switch between front and back side of the business card, and text message to remind the user which side is currently active. The side zone of business card shows the current creation status of the Business Card.

On the right side is the fourth area which consist of available background templates. On top of this area we can find two buttons. One for adding the custom background and one for removing the background from the side zone.

The last area is placed on bottom of the page. It is the footer. Here is possible to find the information about purpose of application, as well as the name of author.

Chapter 5

Implementation

The chapter 3 revealed that many available on-line programs are limited or they demand registration. The aim of my Application is to be simple, modern and primarily free with features of paid ones. That requires support of QR codes, editation of both sides, inline text editing, adding multiple images, backgrounds and text boxes, and PDF generation. The Application also has to be multi-platform.

5.1 Used Technologies

This Application is using four vital technologies: HTML, CSS, PHP and JavaScript. To make my Application look modern and simple, I used Bootstrap framework. It is the most popular HTML, CSS, and JS framework for developing responsive, mobile-first projects on the web [14]. However, the responsiveness of the application is limited.

5.1.1 Hyper Text Markup Language

HTML is a markup language used for describing the structure of web pages. It contains a set of markup tags called HTML tags, which are used in order to describe different content of the web page. The browser uses HTML tags to determine how to display the document, but it does not display them together with content.

The HTML is one of the two core technologies for building Web pages and its language specification is currently maintained by the World Wide Web Consortium (W3C) [47].

In my Application I use the latest version of HTML called HTML5. The HTML is the first of the vital technologies used in order to make my Application functional. The Application uses two almost identical HTML pages. The only difference between these two pages is used language. The content of the first page is in English and the content of the second page is in Slovak language.

5.1.2 Cascading Style Sheets

CSS is a language used for defining how HTML elements are to be displayed. It is the second core technology for building Web pages.

The HTML was never intended to contain tags for formatting a document. The purpose of HTML was to define the content of a document. In order to solve this problem, the World Wide Web Consortium created CSS [45]. Since HTML 4.0, all formatting should be stored in a separate CSS file. The separation of HTML from CSS makes it easier to maintain sites,

share style sheets across pages, and make the pages look identical or different in various environments. CSS can be also used with any XML-based markup language.

In my application the CSS and HTML are connected through external CSS file `Style.css`. This file determines visual appearance of the application. Other than this file, there are additional external CSS files. These CSS files were slightly edited to correspond with the design of the application, and they are used for correct functionality of third-party Javascript libraries used in this project. They will be mentioned later in this chapter. The description of the appearance can be found in the previous chapter 4.

5.1.3 Hypertext Preprocessor

PHP [37] is a powerful and popular general-purpose scripting language and the interpreter, whether included in a web server as a module or executed as a separate CGI binary.

PHP is very flexible [48]. It can generate dynamic page content, collect form data, send and receive cookies, encrypt data, or create, open, read, write, delete, and close files. PHP is free and it is especially suited to web development.

There are two small PHP scripts used in the Application. The first one is called `bg_upload.php` and it is used to upload background images on the server. The second is `img_upload.php`. The Application uses this file in order to upload logos on the server.

It is good to mention that uploading the files on the server is not enough. The Application has to be able to deal with the duplication of uploaded files. Because of absence of the database, another approach was needed. The solution comes in integrated `microtime()` function. The name is changed before the file upload by appending timestamp with microseconds to the original name. By doing so, the PHP script will be able to successfully minimize the possibility of rewriting of the file. The upload destination can be seen in figure 5.1.

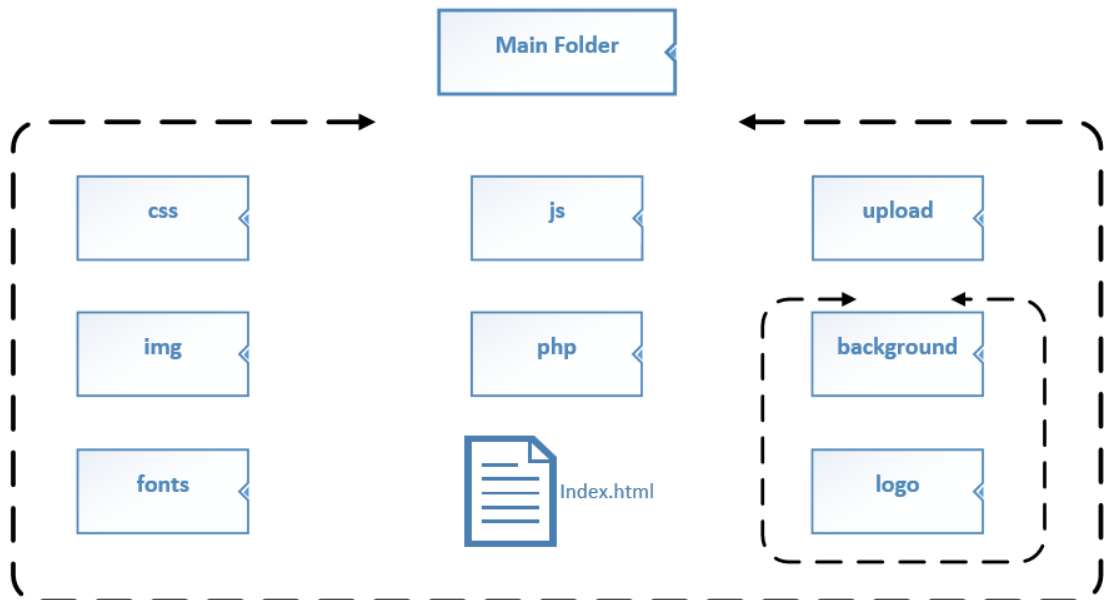


Figure 5.1: Directory structure of the Application.

5.1.4 JavaScript

JavaScript [9] [20] is an interpreted programming language with object-oriented capabilities. It is the most popular programming language in the world [36]. Syntactically, it resembles C, C++ and Java. However here the similarity ends. It is important to note that JavaScript has almost nothing to do with Java. The similar name was inspired by marketing reasons, rather than good judgment. JavaScript is mostly used in web sphere. The language has been adopted by all major web browsers. It has made modern web applications dynamical and interactive without necessity of page reload.

The most popular JS library in use today is jQuery [23]. jQuery is a small, fast, and feature-rich JavaScript library, that makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler. With jQuery there is no need to worry about differences in the way browsers interpret code. Thanks to the combination of versatility and extensibility, jQuery has changed the way that millions of people write JavaScript.

The most important JS file in this Application is `card_details.js`. This file is my own creation and the heart of the Application. Here we can find all the functions related to the functionality of the website. There are functions for downloading fonts from Google API, changing the side of business card, adding new background, logos or texts, and much much more. Except of this file there are other custom created files, but they are mostly used as the initialization of third-party plugins and libraries.

Third-party Software

Before we started, I would like to note that all libraries and plugins used in this application are under MIT licence. The first library I use is jQuery UI [22]. It is a curated set of user interface interactions, effects, widgets, and themes built on top of the jQuery JavaScript library. This library is only used in order to make elements draggable and resizable.

Together with jQuery UI library I use two plugins. The first is jQuery UI Rotatable [15]. This plugin is used to make elements rotate. The second is jQuery UI Touch Punch [11]. Currently, jQuery UI user interface library does not support the use of touch events in their interactions. This plugin will return mouse events instead of their corresponding touch events .

The next library I used in the application is DropzoneJS [28]. It is an open source library that provides drag'n'drop file uploads with image previews. DropzoneJS is used together with my PHP scripts to upload images on server.

In order to make visual side of application look even better, the different scrollbar had to be used. This was done through Malihu Custom Scrollbar plugin [27]. Features include vertical and/or horizontal scrollbar(s), adjustable scrolling momentum, mouse-wheel, keyboard and touch support, ready-to-use themes and customization via CSS, and much more.

Another used JS plugin is noUiSlider [13]. It is JavaScript range slider that works with jQuery or Zepto. It offers a ton off features, and it is as small, lightweight and minimal as possible. It also supports touch events for iOS, Android and Windows devices. The look of the plugin corresponds to the design of the application. It is used to change the size of font.

The next plugin used in the application is Spectrum [18]. It is a small and customizable colorpicker. The application is using this plugin to change the color of the business card, color of the font and the color of the QR code.

In my application I replaced ugly and hard to customize HTML select boxes with pretty and feature rich dropdowns by using SelectBoxIt plugin [10]. SelectBoxIt is used to change type of font, and the main reason of usage of this plugin is the support of font preview.

One of the last used JS plugins is jQuery.qrcode [25]. It enables to add the QR codes dynamically to the website. This plugin is easy to use and feature-rich, but not all features are used due to possibility of unreadability by most QR scanners.

The last two software used in the application are html2canvas script [21] and jsPDF library [19]. The html2canvas script allows taking “screenshots” of webpages or just parts of it. It converts every element inside the side zone of the business card content area into canvas. The canvas is then saved to the variable as PNG image file. This variable is then used by jsPDF, which is used in order to generate final PDF file. Through the jsPDF library is the image inserted into the generated PDF file according to the user specification in figure 5.2.

The image shows a dialog box titled "SAVE FILE TO PDF" with a close button (X) in the top right corner. The dialog is divided into several sections for customization:

- PAPER TYPE:** Two buttons are shown: "A4" (selected with a checkmark) and "LETTER".
- NUMBER OF BUSINESS CARDS:** Three buttons are shown: "1", "8", and "10" (selected with a checkmark).
- MARGIN:** Two buttons are shown: "CUSTOM" and "DEFAULT" (selected with a checkmark).
- MARGIN LEFT:** A slider control set to "0.0 MM".
- MARGIN TOP:** A slider control set to "0.0 MM".
- HORIZONTAL SPACE:** A slider control set to "0.0 MM".
- VERTICAL SPACE:** A slider control set to "0.0 MM".

At the bottom of the dialog, there are three buttons: "CLOSE" (black), "SAVE BACK SIDE" (blue), and "SAVE FRONT SIDE" (blue).

Figure 5.2: Output customization options.

5.2 Customization

The Application would not be very useful without element customization. The User has to be able to change size, type, style or color of the font. In my application I am using `execCommand()` method for all changes related to the font customization.

5.2.1 `execCommand()`

The `execCommand` [7] is one of the root methods of the rich-text editing feature of browsers. It is important to note that it works differently in different browsers and not all commands are working properly in other browsers. An element can be made editable with the `contentEditable` property. The method executes a command on the current document, current selection, or the given range.

The code generated by the `execCommand` method is also different in browsers. Internet Explorer uses HTML tags, on the other hand Firefox, Google Chrome and Safari generate inline styles. The Opera switches between HTML tags and styles.

The `execCommand` method has three parameters:

commandIdentifier

A case-insensitive string that specifies the name of the command

userInterface

Boolean that indicates whether a user interface needs to be displayed or not.

value

Specifies a parameter value for the command.

This Application is using only commands, that work in all major browsers. These commands are shown in the following table 5.1.

Command	Description
<code>bold</code>	Toggles bold on/off for the selection or at the insertion point.
<code>fontName</code>	Changes the font name for the selection or at the insertion point.
<code>fontSize</code>	Changes the font size for the selection or at the insertion point.
<code>foreColor</code>	Changes a font color for the selection or at the insertion point.
<code>italic</code>	Toggles italics on/off for the selection or at the insertion point.
<code>justifyCenter</code>	Centers the selection or insertion point.
<code>justifyFull</code>	Justifies the selection or insertion point.
<code>justifyLeft</code>	Justifies the selection or insertion point to the left.
<code>justifyRight</code>	Right-justifies the selection or the insertion point.
<code>strikeThrough</code>	Toggles strikethrough on/off for the selection or at the insertion point.
<code>subscript</code>	Toggles subscript on/off for the selection or at the insertion point.
<code>superscript</code>	Toggles superscript on/off for the selection or at the insertion point.
<code>underline</code>	Toggles underline on/off for the selection or at the insertion point.

Table 5.1: Used Commands of `execCommand` method.

Chapter 6

Testing and Evaluation

One of the best attributes of online based applications is accessibility. Although the online applications are independent on OS, the visual side depends on which browser is currently used.

The main requirement of this application is to be multi-platform. This requirement is achieved by using different browsers. The supported web browsers are: Google Chrome, Mozilla Firefox, Internet Explorer, Safari and Opera. Even though Safari is supported, it is good to mention that it is only available for Mac OS-X users. Windows version of Safari is just too old and therefore unsupported. Table 6.1 shows tested browsers and their version.

Browser	Version
Mozilla Firefox	37.0.2
Google Chrome	42.0
Opera	28.0
Internet Explorer	11.0
Safari	8.0.5

Table 6.1: Tested browsers with their versions.

Usage of different browsers might result to slight differences like sharpness of font or page zoom, but none of them is important to final appearance of application.

Functionality is also important. The application works correctly in all supported browsers. It is good to mention that JavaScript works a bit differently depending on used browser. Those issues were solved (more or less) by using jQuery library [23]. The biggest problem was with fonts. The first issue was with size of font. The `execCommand` method has its own seven sizes which are insufficient. In order to choose from more sizes, an additional implementation was needed. After the `execCommand` execution the JavaScript finds appropriate font tag and replaces size attribute with the class attribute. Inside the class attribute is font-size property with desired size of font in pixels.

The second issue was with superscript and subscript in Google Chrome. This problem was solved with CSS by setting `sub` and `sup` tags its correct vertical-align property.

The application successfully passed W3C Validator and it corresponds to the HTML5 standard [44].

Chapter 7

Conclusion

The intention of this bachelor thesis was to create a web application that will be used in order to create business cards. One of the requirements was to research typographic principles. Those principles together with history of business cards and etiquette are described in chapter 2.

The chapter number 3 focuses on available online and offline applications, their advantages and disadvantages. After this analysis, the design of the application has been created. My aim was to create free, simple and modern-looking application with easy usage and more functionality than other free available applications.

The visual side of application is discussed in chapter 4. The aim of the chapter 5 is to describe the implementation of the application and inform about used technologies.

The chapter 6 contains details about testing of the application, used browsers and problems which had to be dealt with.

Although the application is finished, there still are features that are unsupported by the application. These features could be supported in the future as extensions. The biggest improvement would be the database support. It would be useful to be able to create user profile, where the user could save his designs for future editing. The next improvements would be changing the language dynamically, adding more templates, support of shapes and lines, giving decorations to fonts, adding more customization to images, or choosing the number of business card generated to PDF. It would be also useful, if the image quality was higher, when using html2canvas library.

Bibliography

- [1] BizCardMaker.com: Business Card Maker. [online], [cited 2014-10-27].
URL <https://www.bizcardmaker.com/>
- [2] Business-Card-Size.net: Business Cards Size. [online], [cited 2014-10-27].
URL <http://business-card-size.net/>
- [3] CAM Development: Business Card Designer Plus. [online], [cited 2014-10-27].
URL https://www.camdevelopment.com/designer/business_card/
- [4] CardPrinting.us: Business Card Design Psychology. [online], [cited 2014-10-27].
URL <https://www.cardprinting.us/blog/2013/01/business-card-design-psychology-2/>
- [5] ColorFXWeb.com: The 11 Parts of a Business Card. [online], [cited 2014-10-27].
URL <http://www.colorfxweb.com/blog/2010/02/the-11-parts-of-a-business-card/>
- [6] DeGraeve.com: Make Free Business Cards. [online], [cited 2014-10-27].
URL <http://www.degraeve.com/business-cards/>
- [7] Dottoro.com: execCommand method. [online], [cited 2015-04-20].
URL <http://help.dottoro.com/ljcvtcaw.php>
- [8] Elcor: Business Card Studio. [online], [cited 2014-10-27].
URL <http://business-card-studio.en.softonic.com/>
- [9] Flanagan, D.: *JavaScript: The Definitive Guide*. O'Reilly Media, Inc., 2006, ISBN 978-0-596-10199-2.
- [10] Franko, G.: SelectBoxIt. [online], [cited 2015-04-19].
URL <http://gregfranko.com/jquery.selectBoxIt.js/>
- [11] Furfero, D.: jQuery UI Touch Punch. [online], [cited 2015-04-19].
URL <http://touchpunch.furf.com/>
- [12] Galitz, W. O.: *The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques*. Wiley Publishing, Inc., 2007, ISBN 978-0-470-05342-3.
- [13] Gersen, L.: noUiSlider. [online], [cited 2015-04-19].
URL <http://refreshless.com/nouislider/>

- [14] GetBootstrap.com: Bootstrap. [online], [cited 2015-04-07].
URL <http://getbootstrap.com/>
- [15] Godswearhats: jQuery UI Rotatable. [online], [cited 2015-04-19].
URL <https://github.com/godswearhats/jquery-ui-rotatable>
- [16] Google.com: Google Fonts. [online], [cited 2015-04-07].
URL <http://www.google.com/fonts>
- [17] GreatFXPrinting.com: History of Business Cards. [online], [cited 2014-10-27].
URL <http://www.greatfxprinting.com/articles/history-of-business-cards.htm>
- [18] Grinstead, B.: Spectrum. [online], [cited 2015-04-19].
URL <https://bgrins.github.io/spectrum/>
- [19] Hall, J.: jsPDF. [online], [cited 2015-04-19].
URL <https://github.com/MrRio/jsPDF>
- [20] Haverbeke, M.: *Eloquent JavaScript*. No Starch Press, Inc., 2015, ISBN 978-1-59327-584-6.
- [21] von Herten, N.: html2canvas. [online], [cited 2015-04-19].
URL <http://html2canvas.hertzen.com/>
- [22] jQuery.com: What is jQuery? [online], [cited 2015-04-19].
URL <https://jquery.com/>
- [23] jQueryUI.com: jQuery UI. [online], [cited 2015-04-19].
URL <https://jqueryui.com/>
- [24] JukeboxPrint.com: Jukebox. [online], [cited 2014-10-27].
URL http://www.jukeboxprint.com/editor/business_cards.php
- [25] Jung, L.: jQuery.qrcode. [online], [cited 2015-04-19].
URL <http://larsjung.de/jquery-qrcode/>
- [26] Linux-Mag.com: Linux Bootable Business Card. [online], [cited 2014-10-27].
URL <http://www.linux-mag.com/id/1036/>
- [27] Malihutsakis, M.: jQuery custom content scroller. [online], [cited 2015-04-19].
URL <http://manos.malihu.gr/jquery-custom-content-scroller/>
- [28] Meno, M.: DropzoneJS. [online], [cited 2015-04-19].
URL <http://www.dropzonejs.com/>
- [29] Microsoft: Outlook. [online], [cited 2015-04-19].
URL <https://products.office.com/en-us/outlook/email-and-calendar-software-microsoft-outlook>
- [30] Mojosoftware: BusinessCards MX. [online], [cited 2014-10-27].
URL businesscards-mx.com

- [31] Moo.com: Business Cards. [online], [cited 2014-10-27].
URL <http://eu.moo.com/create/pixel.php?uuid=d70d1c47-14df-4aba-97b8-bff52d938500>
- [32] Moo.com: The evolution of Business Cards. [online], [cited 2014-10-27].
URL <http://uk.moo.com/partner/the-evolution-of-business-cards/>
- [33] Moo.com: NFC by MOO. [online], [cited 2014-10-27].
URL <http://eu.moo.com/nfc/>
- [34] NCH Software: CardWorks Business Card Software. [online], [cited 2014-10-27].
URL <http://www.nchsoftware.com/businesscard/>
- [35] OfficeMuseum.com: Office Equipment & Supplies at the 1876 Centennial Exposition. [online], [cited 2014-10-27].
URL <http://www.officemuseum.com/centennial%20exposition.htm>
- [36] O'Grady, S.: The RedMonk Programming Language Rankings: January 2015. [online], [cited 2015-04-19].
URL redmonk.com/sogrady/2015/01/14/language-rankings-1-15/
- [37] PHP.net: PHP. [online], [cited 2015-04-17].
URL <http://php.net/>
- [38] PsPrint.com: Business Card Etiquette in the U.S. [online], [cited 2014-10-27].
URL <https://www.psprint.com/resources/business-card-us-etiquette/>
- [39] PsPrint.com: Design Your Own In Four Easy Steps. [online], [cited 2014-10-27].
URL <https://www.psprint.com/design-templates/spectrum-prism-23943867.aspx>
- [40] Smith, T. T.: 10 Business Card Mistakes You Might be Making. [online], [cited 2014-10-27].
URL <https://archive.ama.org/Archive/Careers/Pages/10-Business-Card-Mistakes-You-Might-be-Making.aspx>
- [41] Stevens, T.: 12 Creative Business Cards That Double as Cool Gadgets. [online], [cited 2014-10-27].
URL <http://www.internationalbusinessguide.org/category/featured/>
- [42] USB2u.co.uk: USB Cards Offer up All Sorts Of Promotional Options. [online], [cited 2015-04-19].
URL <http://www.usb2u.co.uk/articles/tag/usb-business-cards/>
- [43] VentureJapan.com: Japanese business etiquette. [online], [cited 2014-10-27].
URL <http://www.venturejapan.com/japanese-business-etiquette.htm>
- [44] W3.org: Markup Validation Service. [online], [cited 2015-04-20].
URL <https://validator.w3.org/>
- [45] W3Schools.com: CSS Introduction. [online], [cited 2015-04-17].
URL http://www.w3schools.com/css/css_intro.asp

- [46] W3Schools.com: HTML Form Elements. [online], [cited 2015-04-03].
URL http://www.w3schools.com/html/html_form_elements.asp
- [47] W3Schools.com: HTML Introduction. [online], [cited 2015-04-17].
URL http://www.w3schools.com/html/html_intro.asp
- [48] W3Schools.com: PHP 5 Introduction. [online], [cited 2015-04-17].
URL http://www.w3schools.com/php/php_intro.asp
- [49] Wayne, J.: The Psychology of Color. [online], [cited 2015-04-19].
URL <http://jamiewayne.com/2011/02/06/xxxi-the-psychology-of-color/>
- [50] Young, S.: User Interface Design With Markup. [online], [cited 2015-04-17].
URL <http://mi.eng.cam.ac.uk/~sjy/3F6/web9.pdf>
- [51] YourDictionary.com: vCard - Computer Definition. [online], [cited 2014-10-27].
URL <http://www.yourdictionary.com/vcard>

Appendix A

Content of the CD

The CD attached to this thesis contains following directories and files:

Directory [source](#)

The directory contains all source files necessary for running the web application.

Directory [thesis](#)

This directory consists of all thesis source files.

Directory [examples](#)

The output examples can be found inside of this directory.

File [bachelor_thesis.pdf](#)

Technical report in PDF format.

Appendix B

Examples of the Output

Examples of the Business Cards generated by my web Application.



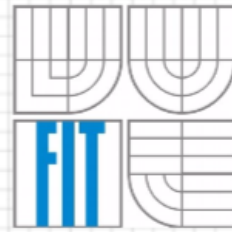
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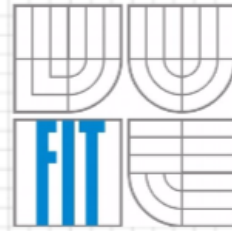
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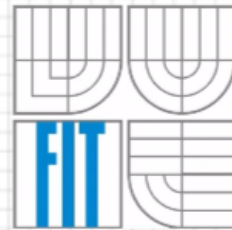
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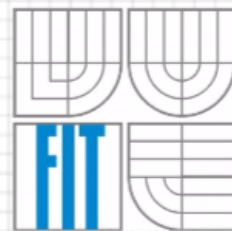
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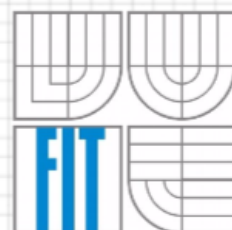
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