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An inter-organizational interface for ERP-Systems and marketplaces in the wine industry

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An inter-organizational interface for ERP-Systems and marketplaces in the wine industry

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Abstract

The life-cycle of a new wine year in Austria begins shortly after grape harvesting. In fall the vineyards have to be prepared for the grape growth of the next year. During the wine year until late summer, much work in the vineyards has to be done. A large part of the working steps are supported by technical devices such as a tractor or other agricultural equipment. Important working steps like pest control have to be recorded, but apart from that not much data has to be gathered in these early steps of work. Only after the start of grape harvesting much information about the wines e.g. quantity and gradation has to be recorded. After harvesting the wine has to mature and to be tasted now and then to eliminate potential wine faults. During the process of maturing a huge amount of data arises. In the end, bottling is the last step in the wine production cycle.

All of these steps are supported by ERP solutions for wineries and the information can easily be stored and accessed within them.

After the production cycle the financially important process of marketing and sales begins. Sales processes in the wine industry can be either classical via retail stores or via e-commerce processes. They need on the one hand many information from production processes such as quantity, alcohol or residual sugar. On the other hand there also arise much new information such as quantity of bottles, sales data and many more. Although the ERP systems support some parts of sales processes e.g. invoices or stocks, they leak in data communication with other sales systems such as webshops. Data gathered in those has to be maintained manually.

Administrative data can also be forwarded to governmental departments online but the data exchange between ERP system and e-government tool happens manually this present day.

For that reason the task of this Master Thesis is to develop a communication interface called *WineDataXchng Interface* for wine and winery data. Because of complex and versatile data structures for storing wine information we divide the analysis of the Austrian wine market into three subparts: Survey on computer supported viticulture, analysis of cellar management applications and a web fitness analysis. The knowledge of these analyses get aggregated while developing the interface and prototype.

First we interview 233 wine-growers concerning “Computer supported viticulture” in an online survey developed for the Austrian wine market. The survey contains questions on topics regarding computer usage and popular software solutions, especially cellar management applications. Questions relevant for the marketing and e-commerce usage in wineries get answered as well. Furthermore, the question whether wine-growers will use more computer-supported technologies in the near future get answered.

In the next step, frequently used cellar management applications in Austria and one application from Germany get analyzed regarding their provided services & features. Besides the services & features we also evaluate the usability of the cellar management applications. A further task of this analysis is to find out which wine and winery data will be needed for a generally applicable communication interface.

As the communication interface will also get used in the area of e-commerce, we analyze 100 websites of Austrian wineries. The results of the analysis show that Austrian winery websites score solid average results regarding contents, structure and design. Furthermore many wineries use CMS systems for their websites. With the gained knowledge about the *eFitness* of Austrian winery websites, one can conclude that the need for a communication interface for automatic data exchange in the area of e-commerce of wineries increases steadily.

Now we were able to develop the XML communication interface with all the evaluation data of the previous analyses. The XML based interface is called *WineDataXchng Interface* and has a modular design to allow a versatile and flexible communication for various methods of use. A few of these ways of usage can be shown by the implemented prototype. The prototype includes a Java library to convert various data types to WineDataXchng XML which makes it possible to in- and export data via the *WineDataXchng Interface*. The prototype shows that the developed interface not only works in theory but also under real conditions.

Kurzfassung

Der Zyklus eines neuen Weinjahrgangs in Österreich beginnt bereits nach der Weinlese im Herbst. Im Weingarten müssen schon die ersten Vorkehrungen für das Wachstum der Trauben im nächsten Jahr getroffen werden. Über das ganze Jahr bis in den Spätsommer muss der Weingarten bearbeitet werden. Viele dieser Arbeitsschritte passieren technikgestütz durch Traktor und andere landwirtschaftliche Geräte. Wichtige Arbeitsschritte wie z.B. die Schädlingsbekämpfung müssen auch in dieser frühen Phase bereits mitprotokolliert werden, jedoch fallen noch keine großen Datenmengen an. Erst ab dem Beginn der Weinlese müssen sämtliche Informationen, wie z.B. Menge oder Gradation, protokolliert werden. Nach der Ernte muss der Wein reifen und immer wieder probiert werden um eventuelle Weinfehler schon im Ansatz bekämpfen zu können. Bis der Wein gereift und bereit für die Flasche ist, fällt bereits eine große Datenmenge an. Der letzte Schritt in der Weinverarbeitung ist das Abfüllen in Flaschen.

Alle, bis jetzt beschriebenen Schritte, werden durch diverse ERP Lösungen für den Weinbau unterstützt. Die Daten können problemlos gespeichert werden und sind an einer Stelle schnell und zuverlässig verfügbar.

Doch nun erst beginnt der, aus finanzieller Sicht wichtige, Prozess der Weinvermarktung. Bei der Vermarktung der Weine, sei es auf klassischen Vertriebswegen oder online mittels E-Commerce Praktiken, werden einerseits viele Daten aus dem Verarbeitungsprozess benötigt (z.B. Menge, Alkohol, Restsüße, ...) und andererseits fallen viele neue Daten (gefüllte Flaschen, Verkaufszahlen, ...) an. Zwar unterstützen ERP Systeme meist auch bei der Rechnungsstellung und Bestandshaltung, doch alle Verkaufsdaten die zusätzlich in anderen Systemen (z.B. Webshops) anfallen, müssen manuell in den jeweiligen Systemen gepflegt und auch manuell ins "Hauptsystem" übernommen werden.

Verwaltungsdaten die ebenfalls den zuständigen Ämtern gemeldet werden müssen, können zwar online abgegeben werden, der Datenaustausch zwischen den Systemen muss trotzdem mittels manueller Dateneingabe durchgeführt werden.

Aus diesem Grund wird in dieser Diplomarbeit die Kommunikationsschnittstelle *WineData-Xchng Interface* für Wein- und Weingutdaten entwickelt. Da die Strukturen zur Speicherung dieser Daten sehr komplex und vielseitig sind, ist die Analyse des österreichischen Weinbaumarktes in drei Teilbereiche gegliedert: Umfrage zur Computerunterstützung im Weinbau, Analyse von Kellerbuchprogrammen und Web Fitness Analyse. Die Erkenntnisse und Ergebnisse dieser drei Analysen werden bei der Entwicklung der Schnittstelle und des Prototypes zusammengefasst.

Zunächst werden in einer für den österreichischen Markt zugeschnittenen Umfrage, 233 Winzerinnen und Winzer zum Thema "Computerunterstützter Weinbau" befragt. Die Umfrage

findet Antworten zu Fragen in Themen wie z.B. in welchen Bereichen der Computer eingesetzt wird, welche Softwarelösungen hier verwendet werden, im speziellen für das österreichische Kellerbuch, aber auch Fragen zu Marketing und E-Commerce Einsatz in Weinbaubetrieben. Außerdem wird auch beantwortet ob der Winzer der Zukunft mehr computergestützte Technologien einsetzen wird.

In einem weiteren Schritt werden die, durch die Umfrage hervorgegangenen, häufig verwendeten ERP Lösungen für den Weinbau in Österreich und eine Lösung aus Deutschland getestet um herauszufinden welche Services und Features angeboten werden und vor allem welche Wein- und Weingutdaten für eine allgemein einsetzbare Kommunikationsschnittstelle berücksichtigt werden müssen. Die Kellerbuch Applikationen werden außerdem noch hinsichtlich ihrer Usability getestet.

Da die Schnittstelle auch im E-Commerce Bereich ihren Einsatz finden wird, werden in der Web Fitness Analyse 100 Winzer Webseiten analysiert und ausgewertet. Analysen ergeben, dass die Winzer Webseiten im guten Mittelfeld bezüglich Inhalt, Struktur und Aussehen liegen. Weiters setzen bereits viele Winzer auf CMS Systeme für ihre Webseiten. Die gewonnen Kenntnisse über die Web Fitness der österreichischen Winzer Webseiten zeigen vor allem dass es durchaus an der Zeit ist auch im E-Commerce Umfeld der Weinbaubetriebe einen automatisierten Datenaustausch zu ermöglichen.

Mit den gewonnen Kenntnissen aus den Analysen wird im letzten Teil der Arbeit die XML Kommunikationsschnittstelle entwickelt. Die Schnittstelle und einige ihrer Komponenten sind modulartig aufgebaut um für die verschiedensten Anwendungsfälle einsetzbar zu sein. Einige dieser Anwendungsfälle werden mit dem Prototyp gezeigt. Für den Prototypen wurde eine JAVA Library erstellt, mit der es möglich ist verschiedene Datentypen in das *WineDataXchng XML* zu konvertieren und dadurch Daten In- und Export zu ermöglichen. Mithilfe des Prototypen wird gezeigt, dass die entwickelte Schnittstelle nicht nur in der Theorie sondern auch unter realen Bedingungen einsetzbar ist.

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CHAPTER 1

Introduction

1.1 Motivation

Since 2000 the electronic market for wine has been growing steadily [18]. Back in 2008 the online market for wine was growing at a rate of 30 % a year. Although the online market size in 2008 valued slightly less than 2 billion euros worldwide, this was just 5 % of the global wine sales [10]. Looking at different wine platforms, where countless wine-growers sell their wines, one has to say that the idea is great from a customers perspective: A single platform where the customer can buy wines of numerous different wine-growers with just one account and on just one website. But with a growing online market the data exchange about wines increases as well. Unfortunately, there hasn't been any standardized communication interface for wine-data yet.

Furthermore, wine-growers have been doing more and more administrative things concerning their wineries on their PCs. There are diverse solutions for different problems, but one problem remains: None of the existing applications is communicating with another. And again: There is no standardized way of doing so.

For these reasons we think it will be very important to develop a standardized communication interface for the wine industry: a wine data exchange format so to say. With a standardized interface, data exchange in wineries can be revolutionized, administrative work could be improved and new ways to enhance e-commerce processes among wineries and customers could be opened.

1.2 Problem Statement

Technological progress does not stop, not even in the wine industry. Due to numerous data that has to be managed, an increasing number of wineries use some kind of ERP System. There are countless tasks to deal with such as controlling of cooling systems, stock management, CRM systems (including newsletters, ...), web shops and many more. Of course, there are lots of software producers and software solutions covering these issues and supporting wineries in those

areas. Although there are solutions for supporting e.g. the process of winemaking until bottling and supporting the marketing, no combined solution exists. But there also are no defined Interfaces to speak of, which enable data exchange between software tools.

Figure 1.1 illustrates the data exchange problem during the wine life-cycle. The upper (green) half shows the main steps during wine production. These steps are fully supported by cellar management applications (see chapter 4) and information can be stored electronically and the data exchange between the steps happens inside the cellar management applications. The lower (orange) half shows the important marketing process of wine. The big problem, the bottleneck to speak of, is the data exchange process between these two processes. In the lower half many different marketing tools, platforms and distribution channels get used to sell the wines. But every software solution is an ecosystem for itself and do not provide interfaces to share data. This is problematic, because in the wine production process much information is gathered which will be interesting for the customer and during the sales process much customer information is gathered which is interesting for the wine-growers. Until today the wine-growers have to compensate the lack of an interface with manually entering the data in each e-commerce and e-government tool used during the wine life-cycle.

With a data exchange interface, the life of wine-growers could be simplified, because duplicated data inputs will become unnecessary. An example for manual data inputs in the areas of B2B (or B2A) is the report of the current wine stock for a winery. Since fall 2013 this report has to be managed online via an e-government tool. Even if a winery does all its accounting[1] with the help of software tools electronically and has all the necessary data in electronic form for the report of the wine stock, the data has to be entered manually in the web mask. This extra effort could be avoided if there was a user-friendly interface with the possibility to send reports automatically from within the ERP System to the agency.

If the wine-grower runs his own web shop, or is a member of a third party marketplace for wine, a similar example shows duplicate data inputs in the field of B2C: All data of wines including varieties, stock, maybe some kind of description is available electronically in the ERP System. But to transfer all data to the online shop has to be done manually again. If there existed an interface to exchange data between ERP Systems and for instance a marketplace, typing things in manually would not be necessary and it would take less effort to keep different data sources up to date. And again, less time effort equals saving money.

[1] In Austria, accounting in wineries is called „Kellerbuch“. The “Kellerbuch” contains the stock of wines, bottled wines, sales data, etc.

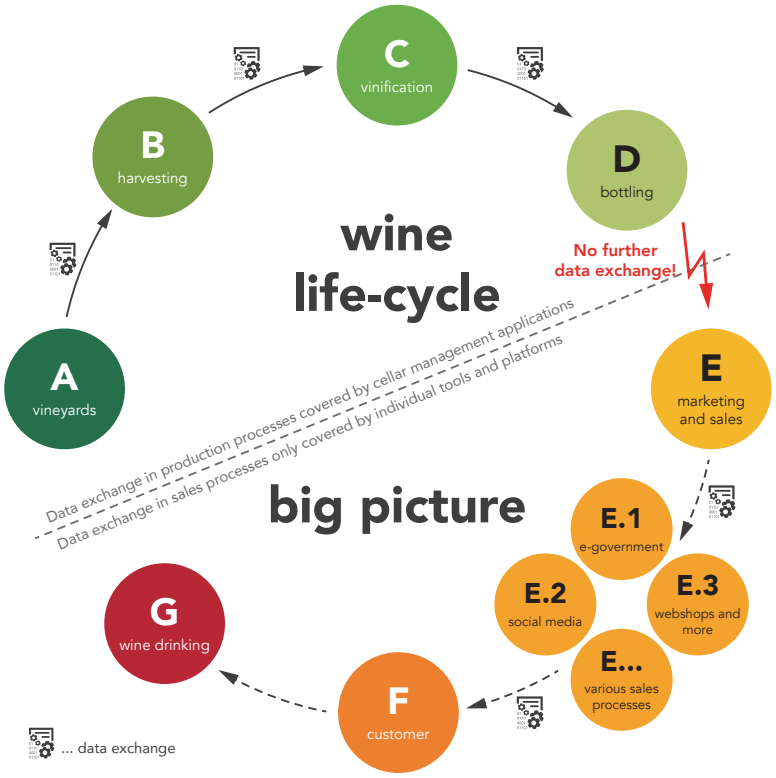


Figure 1.1: Problem statement - "Wine life-cycle big picture"

1.3 Aim of the Work

The result of this master thesis is a universally valid data exchange interface for software solutions for wineries. With the interface a proper communication between different systems shall be possible. To meet our goal we have to divide the thesis in three analyses parts and two practical parts. In the analyses part we first conduct a user survey addressed to Austrian wine-growers to answer questions as if and how many wine-growers are currently using ERP Systems for their accounting and which services & features or additional requirements accounting software for wineries should include. The answers to these questions help to get an overview of the used computer systems to define a more complete interface. In the second step, existing ERP Systems for wineries get evaluated. For the purpose of a better understanding to produce an interface, the services & features used by the ERP System are analyzed. In the third step, websites of wineries get checked regarding their *web fitness*[2]. The *web fitness* analysis is aimed at a deeper understanding for the online wine market.

[2]The *web fitness* analysis includes a deeper look on websites of wineries to check how they present their company in the "new media" on the one hand and whether they just have a website for image purposes or a website including a webshop and other interaction possibilities. On the other hand a user survey addressed to the wine-growers will answer questions regarding the usage of the internet as a marketing channel for wineries.

In the second practical part, the results of analysis and evaluation help to define the data exchange interface and help to create a prototype for the interface which made a test under real conditions possible. With this way we can ensure that the interface is generally applicable.

A further explanation why we structured our thesis in this way is given in section 1.6 and is illustrated in figure 1.2

1.4 Hypotheses

For our work we constructed several hypotheses. The main hypothesis addresses the core issue of the work and the further hypotheses refers to the research chapters and are related to the main hypothesis. The chapters 3, 4, 5, 6, 7 and 8 find answers to (dis)prove the validity of the hypotheses. In every chapter the respecting hypotheses are highlighted and answered. In chapter 8 (Summary, Limitations and Future Work) the main hypothesis get answered.

Assuming that many processes in viniculture are computer supported, the hypotheses are:

Main Hypothesis

H.Main No homogeneous communication interface between different systems in the wine industry exists.

Wine Survey

H.A1 Wineries are using many computer-supported devices and processes during the wine life-cycle.

H.A2 Wine-makers don't want to use the new online tool Wein-Online.

H.A3 The skepticism and fear about new technologies is high.

Cellar Management Applications

H.B1 Cellar Management Applications do not provide enough features for sufficient use in a winery.

H.B2 There is a lack of usability in cellar management applications.

H.B3 The concepts how data is entered in the applications are old-fashioned.

Winery Web Fitness

H.C1 Websites are e-commerce channel no. 1 for wineries.

H.C2 Websites of wineries are out-dated.

Wine Data Exchange Interface

H.D1 It is possible to design a generally applicable communication interface for wineries.

Prototype

H.E1 A prototype can be developed to show how the interface works.

1.5 Methodological Approach

To (dis)prove our hypotheses we use the following methodological approach:

Survey on computer usage in wineries **Survey**

Due to no IT-related information in the area of Austrian wineries a survey especially for Austrian wineries had to be conducted. Generally, the survey was about the usage of computer systems in wineries. As example, following questions were asked: Do the wineries use such systems and if yes, which ones are widely used? Are there any special needs for services and features the wineries have been missing so far? With this kind of information the business application analysis and the definition of the communication interface will be easier and widely used systems can be supported from the beginning.

Business application analysis **Desk Research**

In this step of the working process existing ERP systems for wineries got evaluated and analyzed to gather knowledge about features and service bundles of those. With the help of these results we know which kind of data needs to be exchanged via the interface.

Web fitness analysis **Desk Research**

There are countless possibilities for wineries to sell their products to their customers (local stores, online shops, wine stores, etc.). In order to get a picture of the current e-commerce situation on the market, we took a closer look at websites of wineries and analyzed them with respect to their *web fitness*. The following questions were answered: How do winegrowers present their wines? Which information about the wines and winery is available? Can a customer find some information about sales conditions and sales outlets? Do they have their own web shop, or is there a possibility to order via e-mail? Do they use a third party web platform to sell their wines?

Definition of the interface **Practical Part**

Knowing all the hard facts about the ERP systems and the e-commerce market of wineries, the inter-organizational interface could be defined although it is not as easy as one would think. Wine itself has a very complex structure and there are many different characteristics that have to be supported: different varieties, the residual sugar, acidity or the must weight, which is measured differently in various regions. An important fact for doing the wine stock report is that wine can be stored in various tanks, so a meaningful structure for saving this kind of information had to be found.

Demonstration of feasibility **Practical Part**

With the help of the XML data schema and the knowledge about widely used systems in wineries, a working prototype of the interface get implemented to demonstrate the results. This prototype is able to show how the interface works under real conditions.

1.6 Structure of the Master Thesis

This master thesis includes five different topics which co-operates with each other. The four topics are: A survey among Austrian wineries, a cellar management application analysis, a winery web fitness analysis, the XML interface and the development of a prototype. These five parts are necessary because of the complexity of the wine market. The main requirement of the interface is to be generally applicable in the wine market. Therefore we have the need to analyze the whole wine market.

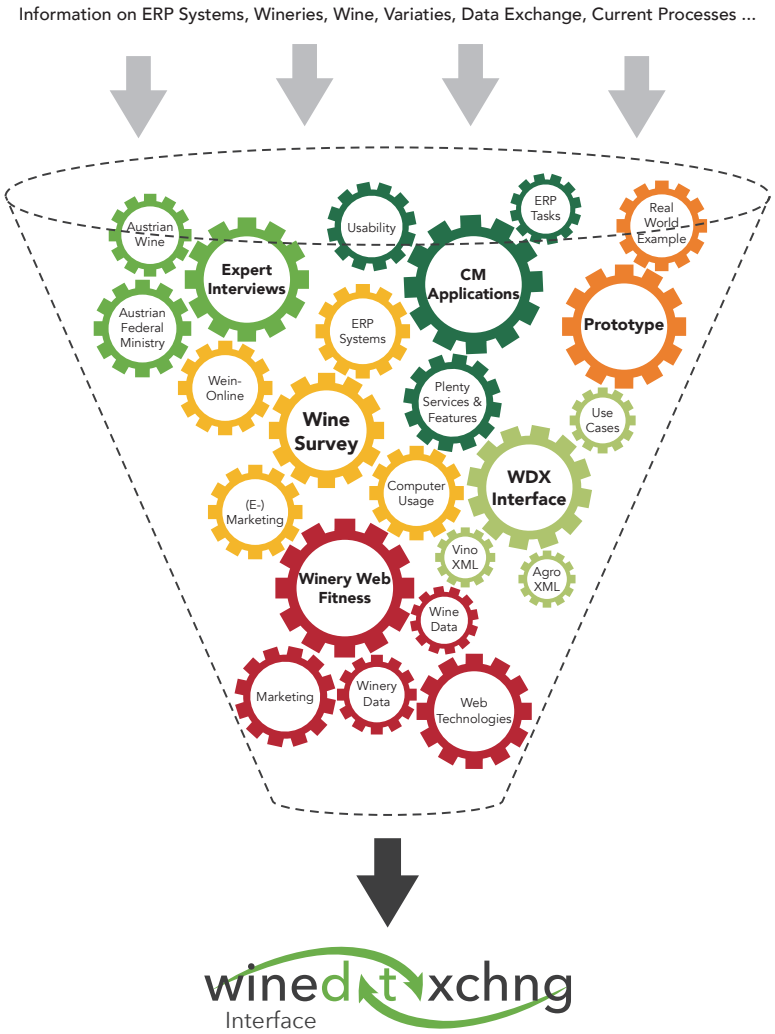


Figure 1.2: Close co-operation of single topics.

Figure 1.2 illustrates the complexity of developing the interface. The big gearwheels show the main parts of the theses. The smaller ones depict various elements of our analyses. Altogether they are connected to each other as in a gearbox. The dotted funnel around the gearwheels

emphasizes the huge amount of data which has to be taken into account and filtered to develop a generally applicable interface for the wine market.

Due to the different analyses and our requirements the thesis compromises six main chapters, which are:

Related Work
Although little work in the field of this master thesis has been done yet, there are many other topics which are related to this master thesis. This chapter gives a short introduction to some of the related work and topics of other authors.

Wine Survey
A survey addressing wine-growers in Austria is conducted to answer questions regarding software usage, website and webshop usage and general computer usage in Austrian wineries. The answers to the survey are a basis for the following chapters.

Cellar Management Applications
There are several cellar management applications which support the wine-grower while administrating their winery. In this chapter three widely used applications in Austria and one online solution from Germany are tested and evaluated regarding the services and features they offer.

Winery Web Fitness
Due to the fact that many wine-growers also run a website to advertise their winery and products, we test the wineries regarding their web fitness. Do the wineries provide good looking websites with meaningful information or do they just have a website because it is state of the art nowadays? Which information do wineries offer on their websites? Questions of these kinds get answered.

Wine Data Exchange Interface
After analyzing wineries and their tools in every detail, we have enough knowledge to develop a communication interface for the wine industry. The structure and functionality of the communication interface is discussed and explained in detail in this chapter.

Prototype
After the theoretical work in the previous chapters, this chapter tries to show you how the communication interface will work in practice. A simple prototype was developed and implemented in an existing online platform for testing purposes. We show that our interface is capable of converting different wine data types into our WineDataXchng Format without losing any information.

Summary, Limitations and Future Work
Finally, the master thesis is summarized. Moreover, limitations and possible future work are pointed out.

CHAPTER 2

Related Work

This master thesis touches many subjects which are related to the main topics of the master thesis. The categories for related work to this thesis are:

- IT based assistance in Viticulture
- E-Commerce Tools in Viticulture
- ERP Systems
- EDI - Electronic Data Interchange
- UN/EDIFACT
- XML
    - XML Interfaces in Agri- and Viticulture
- Evaluation Methods
    - Usability
    - Information Systems and Websites
- Questionnaires

In figure 2.1 one can see an overview of the topics and the scientific publications and other work related to the master thesis.

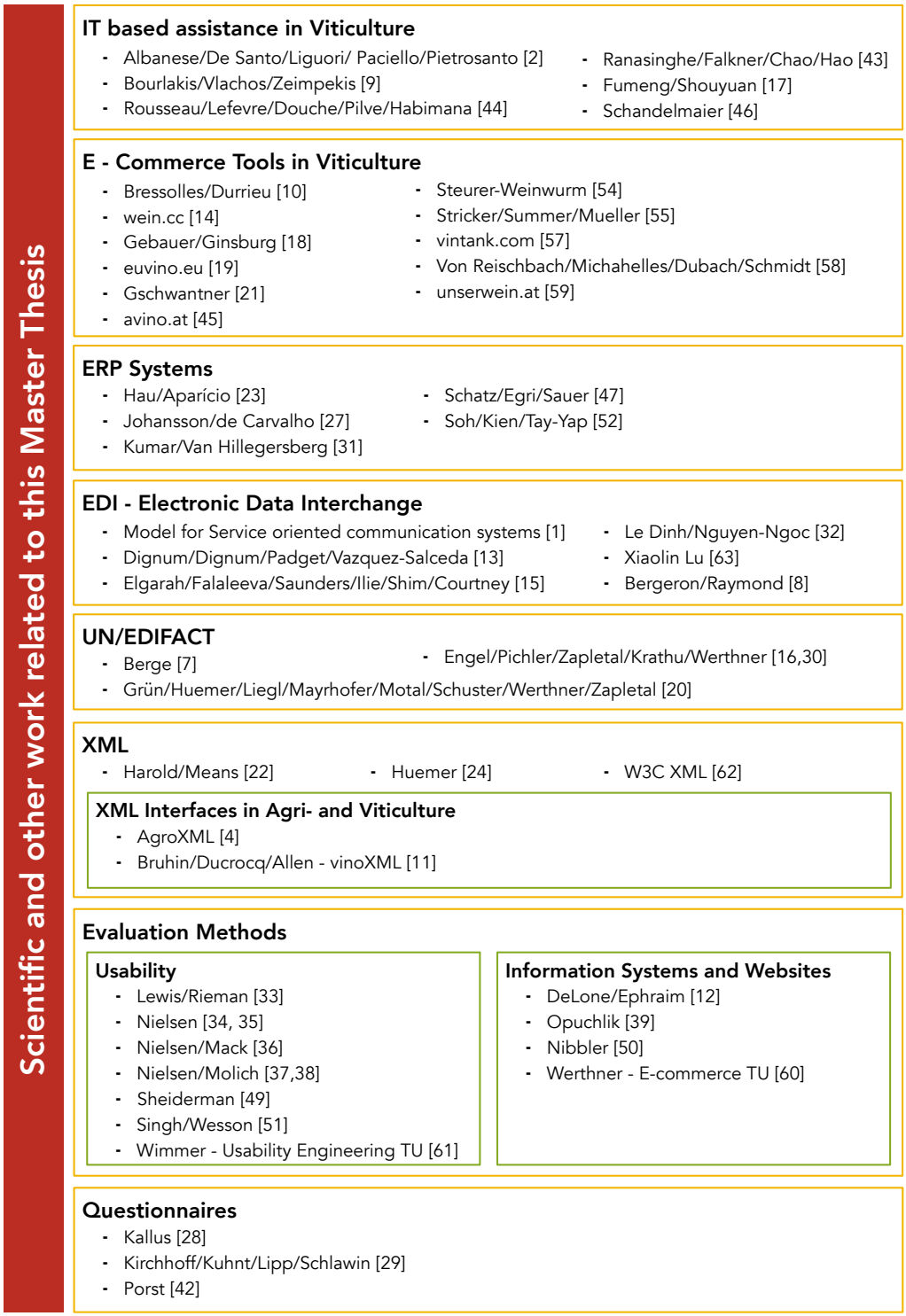


Figure 2.1: Overview of related articles, publications and papers.

2.1 IT based assistance in Viticulture

Over the last years technical assistance (regarding computer systems) in viticulture has increased immensely. Nowadays nearly every new farming device has integrated computer supported systems. The systems in tractors for example get more innovative and complex every year. Today tractors have continuously variable transmission and automatic steering systems. Stabilization systems for driving through rough terrain also are included. Of course other devices for the work in the vineyards such as spraying machines or mechanical grape harvesters are computer supported as well.

In France an application called Oenoview [44] shoots high resolution satellite images of vineyards in an area of a total of 15,000 ha to help with the management of the vineyards. The images are analyzed by consultants and consolidated in maps for each vineyard. The maps show the probable quality of the grapes in each zone. With this method, wine-growers can select high quality grapes for high quality wines. [9]

Not only work in the vineyard but also in the wine-cellar is much easier with computer supported devices. Beginning with the press, which works fully automated, the fermentation process can also be controlled electronically. The authors in [2, 17, 43, 46] discuss different technologies and methods to control the fermentation process of wines. Many sensors for the temperature, for example, have to communicate with a manager unit which can regulate e.g. the temperature regarding the situation. The articles [2, 17, 43] describe three different ways of communication between sensors and manager unit and the article [46] discusses a semi-automated method to control the fermentation process with either a density gauge in combination with RFID chips or a refractometer and a smartphone in combination with barcodes on every tank.

Further processes such as bottling with an automated bottling plant are also supported technically. Every step from an empty to the full labeled bottle is controlled automatically.

In addition to many other applications for cellar management there have been attempts to develop communication interfaces, too. These will be discussed in subsection 2.6.

2.2 E-Commerce Tools in Viticulture

Articles of *Bressolles & Durrieu* [10] and *Gebauer & Ginsburg* [18] state that the online and electronic commerce market for the wine sector, especially in the US and France, is steadily growing. World wide annual growth rates of 30 % are mentioned in the articles. But e-commerce [20] usage in Austria is growing, too. Many articles about e-commerce tools for wineries are published in the Austrian *Der Winzer* (a professional journal for wineries in Austria). An article of *Steurer-Weinwurm* [54] discusses proper design and content guidelines for wineries' online profiles. Many useful strategies for social media platforms are also discussed. In the US there is a helpful e-commerce tool to estimate the marketing value of social media profiles for wineries. *Vintank.com* [57] is a platform for wineries which summarizes all information of people talking about any winery on any social media platform. This information is analyzed statistically and valued by algorithms.

Another article in *Der Winzer* of *Gschwantner* [21] discusses the usage of smartphones in combination with the platform unserwein.at [59]. Unserwein.at is a mobile marketing platform for wineries where the user can find information about a winery, the wines, exhibitions or purchase information. The combination of taking a picture of a QR-Code on a wine label with the smartphone and displaying information in the unserwein.at mobile app includes many new customer loyalty capabilities. With the mobile app the wines and the wineries can also be reviewed and rated by the customer. An appropriate article of *Von Reischach, Dubach, Michahelles & Schmidt* [58] also discusses the capabilities of product reviews on mobile phones.

The article of *Stricker, Sumner & Mueller* [55] discusses the e-commerce readiness for the wine markets of Australia, California and Germany by 2003. The study predicates that e-commerce readiness in Australia and California is higher than in Germany. But since 2003 many changes have happened on the European online wine market. By today, platforms like Avino [45] and Euvino [19] support wineries with online shops and online marketing methods. With wein.cc [14] a search engine for wines has also emerged on the European market.

2.3 ERP Systems

Enterprise Resource Planning (ERP) systems are software platforms which support business processes and different tasks in enterprises. ERP systems can support both inter-organizational and e-commerce processes. Most ERP systems usually have a modular system architecture. Financial Management, Human Resource Management (HR), Customer Relationship Management (CRM), Manufacturing or Data Warehouses are just some of the possible modules. Depending on the needs of an enterprise modules, can be part of the system or not [31, 47].

Another functionality within ERP systems is the possibility of customization. One ERP system can never take care of all the needs of different enterprises. For that reason the systems support customization. If an enterprise introduces a new ERP system, they will have to make a trade-off between internal business process adaptions and ERP customizations. In most cases customization is very expensive due to high costs as experts for the customization task are needed [52].

There are different types of ERP systems:

- Proprietary (classical) ERP systems
- Open Source ERP systems
- Web-based ERP systems

Proprietary ERP systems are based on classic closed software licenses. A customer won't have access to the code and will be limited to the customization tasks the ERP system offers. The Open Source ERP systems are based on Open Source Licenses and grant free access to the source code. This means that any customization will be possible. Of course an enterprise will need experts to do the customizations in most of the cases. Although there won't be any license costs, the customization costs are high. Web-based ERP Systems can either be proprietary or open source. As the name implies, they are fully web-based.

Every type of ERP system has its benefits and drawbacks and every company has to decide for themselves which one will meet their entrepreneurial needs [23, 27, 47].

2.4 EDI - Electronic Data Interchange

Electronic Data Interchange is a mature sector of information technology. The term EDI was first mentioned in the late sixties and early seventies [8]. Although EDI exists for so many years now, it has become more important over time [30]. One of the reasons for this is that due to the internet it is crucial for devices and applications to communicate with each other.

EDI describes electronic communication between two (or more) partners. We can take e-mail as a simple example for EDI today. Sending an e-mail is a standardized way of communication: data between sender and recipient gets exchanged electronically. EDI provides organizations with different types of benefits. They can save time and money in various ways. Time consuming paperwork can be reduced when data is exchanged electronically. Transaction costs also sink due to faster processes and expenses for the old-fashioned postal system can be saved by sending e-mails. [8, 15]

EDI is tightly related to interface design. When developing inter-organizational communication networks, interfaces are a crucial part of the work. As there are many different applications used by different companies, there has to be an easy way to exchange data, e.g. if two or more firms cooperate, data exchange will be very important for them. In most cases, companies build enterprise networks with shared information systems and dedicated interfaces like airlines do it. Aside from a network there is the option to define an interface and communicate and cooperate via web services for example. Papers of *Le Dinh & Nguyen-Ngoc* [32], *Reuther & Henrici* [1], *Xiaolin* [63] and *Dignum, Dignum, Padget, & Vazquez-Salceda* [13] describe general frameworks and concepts for the different possibilities of defining and developing interfaces for EDI and inter-organizational communication.

2.5 UN/EDIFACT

When speaking of EDI one important standard always has to be mentioned: The UN/EDIFACT standard. The United Nations / Electronic Data Interchange For Administration, Commerce and Transport (UN/EDIFACT) standard is the international EDI standard for the exchange of commercial data [7]. UN/EDIFACT standard provides a set of syntax rules, used to structure business document data. The document uses symbols as delimiters between different data fields [20]. According to a survey conducted in 2007, EDIFACT is widely accepted in the B2B area and estimated 85% to 90% of the total volume of B2B transactions are carried out via EDI standards [30].

An example for a EDIFACT communication data segment will be:

```
DTM+137:20110712:102'
```

Whereas *DTM* is the segment code (date/time in our example), +,*:* and *'* are delimiters and *137*, *20110712* and *102* are components with information. *137* tells the date/time/period qualifier, then comes the actual date and *102* tells the date/time/period format (YYYYMMDD) [16].

2.6 XML

Extensible Markup Language (XML) is a flexible text based format, that defines rules for encoding data which can be read by both, humans and machines. This type of data is also called semi-structured data. XML can be used for storing and archiving data as well as a communication interface. A big advantage of XML as a communication interface over UN/EDIFACT is its flexibility and human readability. In the areas where EDIFACT is technically restricted, XML can be the successor for EDI [24].

An XML document is hierarchically structured with a root element and other sub-elements. The element is the most important object in an XML document. As mentioned before, every XML document contains one single root element. Every element itself can contain any number of sub-elements, every sub-element can contain any number of sub-sub-elements and so on.

XML follows some syntax rules by itself but for further restriction of a specific data type we can define Document Type Definitions (DTD) or XML Schema Definition (XSD). DTD and XSD can be seen as grammar rules for an XML document. If we want to use an explicit type of XML, we have to follow the rules of an XSD or a DTD. In our communication interface (chapter 6) we developed an XSD, and the XML code generated by our prototype (chapter 7) follows the rules of our XSD. [22, 62]

XML Interfaces in Agri- and Viticulture

During our research we found two projects related to our work. The first project is called agroXML [4] and the second one vinoXML [11]. AgroXML was developed by the Association for Technologies and Structures in Agriculture (Germany) in collaboration with a number of partners from agricultural software providers, the agricultural industry, extension services and research. It is an XML Schema for describing and representing farm work. Its main purposes are to be used as a file format or as a communication interface for agricultural data. Unfortunately the structure of agroXML does not fit for the use in viticulture. It only supports agriculture.

VinoXML seems to be very similar to our project at first glance. It is also an XML Schema for wine data and can be used as a file format or as a communication interface for wine data. But after taking a closer look at the schema definition we found out that vinoXML is suitable rather for storing data in private wine cellar applications[1] than for big cellar management applications[2] or inter-organizational data exchange which our project is suited for. There are a few similarities in structure though, because some wine information remains constant; regardless of whether it is used in small or big applications.

[1] Wine enthusiastics with a huge collection of wines and maybe with a little wine cellar at home often use simple applications to store information about their wines. Such applications only provide simple features such as storing the wine data, the position in the cellar or drinking notes and so on.

[2] See chapter 4.

2.7 Evaluation Methods

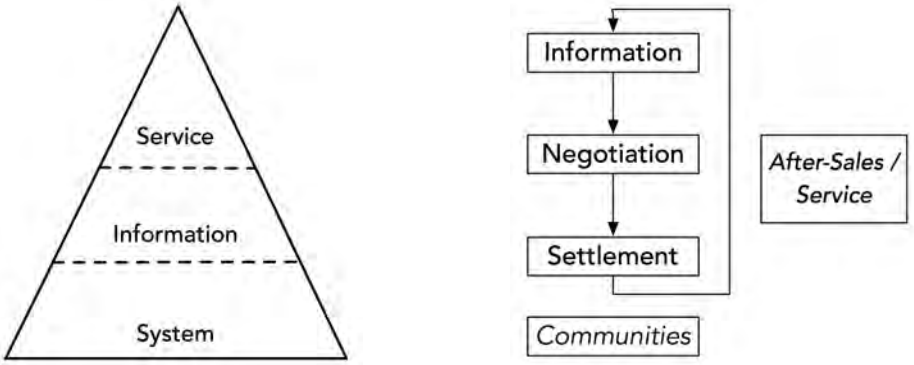
Usability

Usability is rather a subjective than an objective topic. Depending on the user, the usability of a system gets good or bad ratings. Nevertheless usability engineers try to introduce processes to review the usability of an application in a scientific, objective manner. In order to perform usability tests or experiments, several users are needed [61]. When testing the usability of a system, a lack of users or budget often causes problems. Therefore,*Clayton Lewis & John Rieman* describe evaluation methods without users [33]. They discuss different methods such as cognitive walkthroughs, action analyses and heuristic analyses that the designer can use. In cognitive walkthroughs, the designer just needs to think of a use case and think through all possible outcomes. In the second method, action analyses, the designer takes a close look at the sequence of actions a user has to perform to complete a task with an interface. In heuristic evaluations, usability experts assume the role of a user. The experts walk through every possible function a software application offers and evaluate the application with the help of pre-defined heuristics. The heuristics the experts have to follow should ensure objective evaluation results. Well known heuristics are the 10 usability heuristics defined by the usability expert Jakob Nielsen in his works in 1990 and 1994 [34, 36–38]. Other heuristics will be *Shneiderman's eight golden rules for UI design* [49] or five ERP usability heuristics of *Singh & Wesson* [51]. For our application analysis in chapter 4 we used the heuristics of Nielsen because they fitted best for our purposes.

Information Systems and Websites

There are several scientific methods we can use for evaluating websites and Information Systems (IS). An example would be: A counting method with a simple checklist of attributes in order to check whether they exist on a website/IS or not. A drawback of this method is that user satisfaction isn't measured. So called user judgment methods are used to measure user satisfaction. This kind of method is based on questions evaluated by a Likert scale (e.g.: 1 – 7; "like very much" - ... - "do not like at all"). Furthermore, there is the possibility of evaluating websites automatically with software tools. An example for automatic website evaluation is Nibbler [50]. The *DeLone and McLean Model of Information Systems Success* [12] is a well-known general valid framework for evaluating IS. This popular model is the basis for several evaluation models and since its adjustments in 2003 it is even valid for websites. [60]

Werthner [60] also introduced two approaches to evaluate websites (or e-commerce processes). Figure 2.2 illustrates the two models. Figure 2.2a shows the content approach while looking at a website. First, one might look at the services the website offers, afterwards at the information about the products they offer and on the underlaying system they use (e.g. technology, programming language, ...). Figure 2.2b describes the transaction approach. This evaluation approach is based on the transaction phases in an e-commerce process which are: information, decision, negotiation, settlement, transaction and service/after sales [39]. As the second approach is hard to accomplish if one doesn't have access to a system, we followed the first approach for our *web fitness analysis* in chapter 5.



(a) Layered System / Content Approach

(b) Transaction Approach

Figure 2.2: E-commerce (website) evaluation models [60]

2.8 Questionnaires

Conducting a survey isn't as easy as one might think. On the one hand, the questions in the survey have to face the objective of the survey, that means that the evaluation of the questions should give answers to the problem of the survey topic. On the other hand, questions should be easy to understand so that participants won't have any difficulties to answer the questions.

When formulating questions, we have to care about precise wordings, so that no doubts about the meaning may occur. An example for an imprecise question would be: "Do you care about XYZ in future?". As a participant I won't know what the "future" might be.: one month or one year? "Do you care about XYZ in the next 3 months?" would be better. Now the question is formulated precisely. Questions should also sound positive. Participants should not have a bad feeling while answering the questions.

Of course, the number of questions is an important point. If we have too many questions, the participant probably won't complete the survey. But if there are too few questions we may not be able to answer our research questions properly. A good trade-off for the number of questions has to be found in this case.

The survey and the questions have to be geared to our target group of participants. People in the target group should understand the survey and it should catch their attention. That means we have to carry out and advertise our survey in the right places. It doesn't make sense to carry out a survey online if the target group are retirees.

More information on surveys can be found in [28, 29, 42].

CHAPTER 3

Wine Survey

Right at the beginning of this thesis, many issues concerning the usage of computers and computer supported devices in Austrian wineries were unclear. After researching for studies focusing on these topics and interviews with MR DI Dr. Christian Jaborek[1] from *The Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management* (date of the interview: 2013-11-11) and Mag. Christian Dworan[2] from *Austrian Wine* (date of the interview: 2013-12-11) it has become evident that there is no data available to answer the desired questions. For that reason we decided to conduct a survey on the subject of "Computer supported viticulture".

The aim of the survey is to get an overview of the current situation of computer and software usage in wineries. The survey is particularly aimed at wineries of every size on the Austrian wine market to get a representative data sample.

3.1 Participant Acquisition

For our survey, tailored for the Austrian wine market, we have 5000-6000 potential participants. To reach them, we sent out emails to ask for participation in our survey to roughly 300 wineries we know and asked them to forward the mail to their friends. With this snow ball system we reached approximately 2000 wineries of all regions in Austria. As also mentioned in the *Results* section, 282 participants filled in the survey and 233 of these completed the survey and therefore were relevant for analyzing.

Summarizing we can say that nearly 12 % of those who received an e-mail participated in and completed our survey, which is a satisfying return.

[1] Manager of department II/7 - "Obst, Gemüse, Wein, Sonderkulturen" in The Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management.

[2] Manager Markets Exports East: Scandinavia, CEE, Asia-Pacific (former also IT Manager)

3.2 Questions

The survey consists of 49 questions. Some of these questions are bound conditionally to each other. So if all questions get answered in a positive way, the participants will have to answer 45 questions. If all questions get answered negatively (every yes/no-question was answered with no) they will have to answer 39 questions. In order to make the participants keep track of the survey, the questions are divided into five main topics. These topics are:

1. Use of computers
2. Wein-Online (E-Government service in Austria)
3. (E-) Marketing
4. Future computer usage scenarios
5. Demographic Data

The following Table 3.1 lists all questions the survey contains, sequentially listed by topic.

ID	Topic/Question	Type
1	**Use of Computers**	
1.1	Do you have a PC with internet access?	yes/no
1.2	Do you have an application for doing the "Kellerbuch"	yes/no
1.2.y1	Which application do you use?	multiple choice
1.2.y2	What were the basic costs for your application?	single choice
1.2.y3	What are the annual costs for your application?	single choice
1.2.y4	Could the application you use be improved in any way?	text
1.2.n1	Why do you not use a computer for your "Kellerbuch"?	multiple choice
1.3	Do you use a computer for your sales records?	yes/no
1.3.y1	Which application do you use for your sales records?	text
1.4	Do you use a computer or computer supported devices in other areas of your winery?	multiple choice
1.4.y1	Which applications or systems do you use in those areas?	text
1.5	If you do not use a computer for various things now, will you use one within the next 3 years or do you think you aren't PC-fit enough?	yes/no
1.6	How do you administrate your customer data?	single choice
1.7	How do you administrate different prices for different customers?	single choice
1.8	Do you have partners/retailers that sell your wines with commission?	yes/no
1.8.y1	How do you administrate those commissions?	single choice
1.9	How do you write your customers invoices?	single choice
1.10	Which administrative tasks are you currently doing with the support of an application?	multiple choice
1.11	Which administrative tasks would you like to do with the help of an application if it was supported?	multiple choice

ID	Topic/Question	Type
2	**Wein-Online (E-Government service in Austria)**	
2.1	Did you use Wein-Online to do your "Erntemeldung" at home, or did you get help from public administration?	single choice
2.2	Did you have difficulty in using "Wein-Online"? Was it rather easy or complicated?	single choice
2.3	Do you think there is a benefit of using "Wein-Online" compared to doing this on paper?	single choice
2.4	Do you trust in the service, or do you fear misuse of data because of sending it online?	single choice
2.5	Would you use "Wein-Online" for other purposes than the ones required by law?	yes/no
3	**(E-) Marketing**	
3.1	Do you have a website for your winery	yes/no
3.1.n1	Why do you not have a website for your winery?	multiple choice
3.2	Do you send newsletters to your customers?	yes/no
3.2.y1	Which application do you use for creating and sending your newsletters?	multiple choice
3.3	Do you have a webshop where customers can buy your products?	yes/no
3.3.y1	Is your webshop a standard shop or is it adapted to special needs?	single choice
3.3.y2	Do you know the technology your webshop is based on?	single choice
3.3.n1	Why don't you have a webshop?	multiple choice
3.4	Do you use any third party webshops to sell your products?	yes/no
3.4.y1	Which third party webshops do you use?	multiple choice
3.4.n1	Do you know that there is the possibility to sell wines in third party webshops?	yes/no
3.5	Do you sell your products via a partner/retailer?	yes/no
3.6	Do you sell your products via supermarkets?	yes/no
3.7	Which classic distribution channels do you use for selling your wines?	multiple choice
3.8	Is your winery present in some social media platforms?	multiple choice
3.9	How often do you think you have to type in the same data for one wine in different forms? (Think of contests, webshops, social media, ...)	single choice
3.10	Do you plan to use a website/webshop/third party shops or social media within the next 3 years?	multiple choice
4	**Future computer usage scenarios**	
4.1	Can you imagine some future scenarios?	matrix
4.2	If you cannot imagine those scenarios, why not?	multiple choice
5	**Demographic Data**	
5.1	In which wine-growing region of Austria are you located?	single choice

ID	Topic/Question	Type
5.2	What's the size of your vineyard acreage?	text
5.3	How many bottles do you produce annually?	text
5.4	Are you doing viniculture as your main job?	yes/no
5.5	Gender	single choice
5.6	Age	single choice

Table 3.1: Wine Survey Questions. ***Note:*** *ID's with literals indicates conditionally bounded questions. Y means that the question occurs if the previous question was answered with ‚Yes', N is dedicated to ‚No'.*

3.3 Results

The survey has been implemented and carried out with LimeSurvey[3]. The survey started on January 15, 2014 and ended on February 28, 2014. In the timespan of six weeks, 282 wineries participated in the survey whereas 233 participants completed the survey. Only those 233 datasets were relevant for analyzing. After the survey was closed, the data was imported in R[4]. All calculations, evaluations and plots were also done with R.

In the following sections *Descriptive Evaluation* and *Data Correlations* the results are explained in detail. The first section describes the outcome of each question. The second section explains some data correlation of the given answers. Particularly multiple choice questions are considered here.

The detailed survey data can be found in appendix A.1 from table A.3 to table A.15. The question codes used in these tables get explained in table A.2.

Descriptive Evaluation

Demographic Data

Looking at the figures 3.1 to 3.6 demographic data of survey participants is shown.

When comparing actual sizes of wine regions in Austria documented in the Austrian Wine Documentation [3], with the spread over wine regions of our participants in fig. 3.3, we can see that we get a representative sample of participants. The distribution of the gender of participants (fig. 3.1) and wine-production as their main job (fig. 3.2) reflects the Austrian wine sector. Figures 3.4 to 3.6 are also very plausible due to expert knowledge. Especially comparing winery sizes (fig. 3.5) and percentages of bottled wine (fig. 3.6) indicates that we have integrative data.

[3]LimeSurvey is a tool for creating and executing online surveys. `http://www.limesurvey.org`

[4]R is a free software environment for statistical computing and graphics. `http://www.r-project.org`

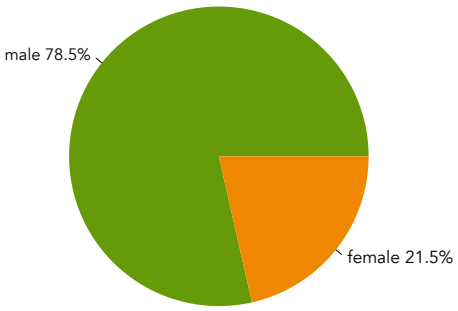


Figure 3.1: Gender of participants

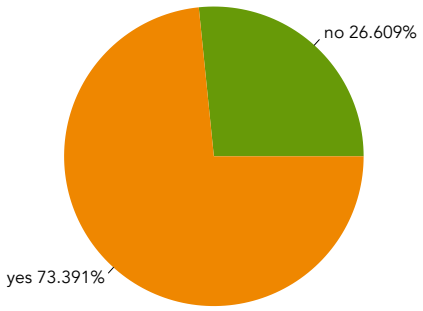


Figure 3.2: Is wine-production the main job?

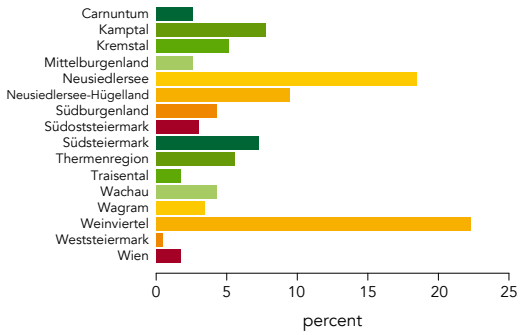


Figure 3.3: Wine-region of participants

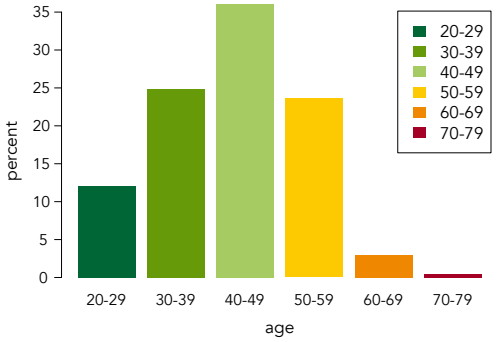


Figure 3.4: Age groups of participants

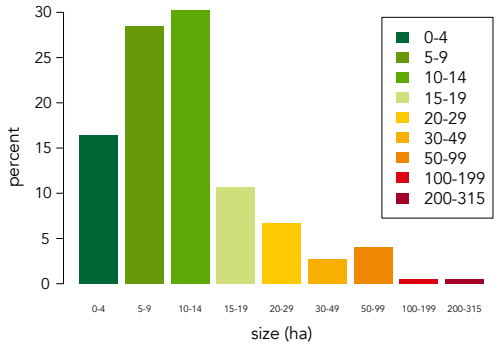


Figure 3.5: Sizes of participants' wineries

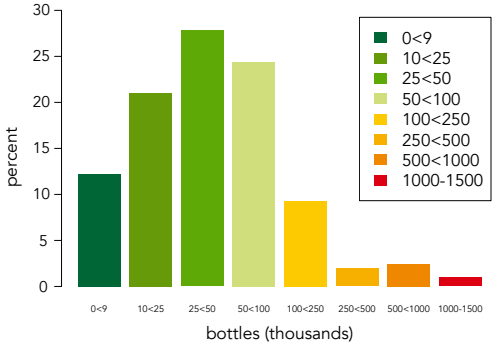


Figure 3.6: Amount of bottles produced

Use of computers

Figures 3.7 to 3.23 explain the answers to the questions in this section. The questions were all about software usage in a winery (Which tasks are done supported by a computer, which

applications do winemakers use, why do they not use a computer for specific things and for which tasks will they probably use an application if they have one?).

Unfortunately some of those questions were biased towards computer usage due to the fact that the survey had only been carried out online. As an example you can look at figure 3.7. Because of interviews with experts from the *The Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management* and from *Austrian Wine* we know that the bigger part of Austrian wineries is not using an application for doing their "Kellerbuch". Unfortunately there are no exact numbers to answer this question. But this fact does not have a big impact on the results. The main purpose of the survey was to find out which applications are used the most and what administrative things are done with a PC in a winery. Wine-growers that do not use a PC for their "Kellerbuch" and other tasks, wouldn't have been able to answer the software usage questions anyway. The graphics that contains possible biased results are: fig. 3.7, fig. 3.15 and fig. 3.17. They are marked in the figure caption as well.

Notice: *In the figure captions, the abbreviation CM refers to cellar management. The term cellar management applies to tasks of doing the Austrian Kellerbuch and beyond, as e.g. doing some administrative tasks or CRM in a winery.*

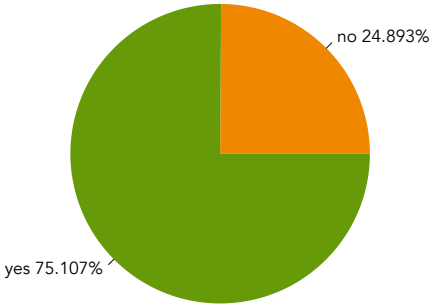


Figure 3.7: Usage of CM apps (biased! Please look at the explanations.)

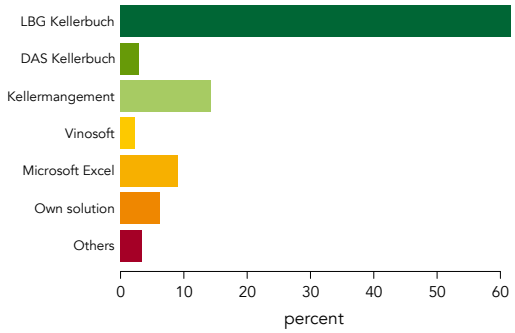


Figure 3.8: Which CM apps are used?

In figure 3.7 we can see that 75% of the survey participants are using a CM app for doing their administrative work. The largest part of those who use a CM app use LBG Kellerbuch, regarding to fig. 3.8. LBG Kellerbuch is followed by Kellermanagement and Microsoft Excel. DAS Kellerbuch is among the less used systems but it is also a special CM app developed for the Austrian market. Most of the wine-growers who are not using any CM app are doing their administrative tasks on paper because they haven't enough PC knowledge, the costs are too high or they fear data loss (fig. 3.9).

Figures 3.10 and 3.11 answer questions about where and which systems wine-growers use beside their CM apps. Computer systems are often used in the cellar, vineyard and in other areas (fig. 3.10). The systems and programs which get used most are shown in the tag-cloud in figure 3.11. Microsoft Excel is very popular for many administrative tasks in the cellar or vineyards. Systems for cooling the tanks and controlling the fermentation process are also common among wine-growers.

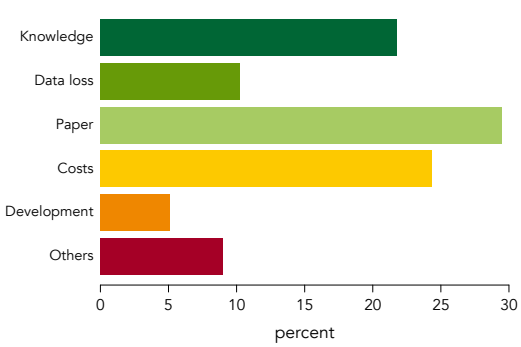


Figure 3.9: Reasons for not having a CM app

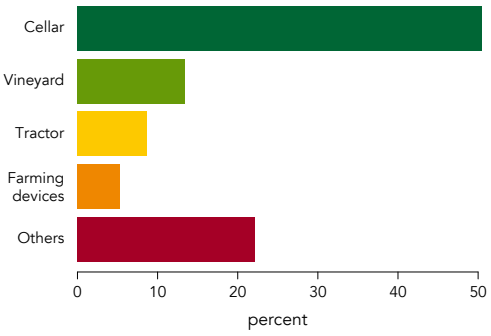


Figure 3.10: Areas where computer systems are used in Austrian wineries

Figure 3.11: Tagcloud of common computer systems in Austrian wineries

Costs are an important factor in the decision process to use a computer program for the administrative tasks in a winery. Therefore we are interested in the basic and annual costs of CM apps. Figure 3.12 illustrates the price ranges of CM applications. Most applications are in a price range of 500 € to 1000 €. More expensive software solutions are mostly used in large wineries. The annual costs (fig. 3.13) fits perfectly to the basic costs. Most of the wineries have annual maintaining costs of 100 € to 250 €.

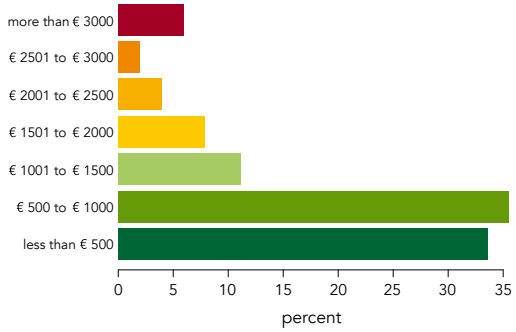


Figure 3.12: Basic costs of CM apps

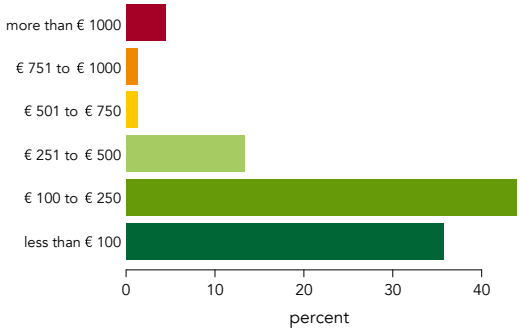


Figure 3.13: Annual costs of CM apps

Further we are interested which parts of the CM applications could be improved. As the tag-cloud in fig. 3.14 illustrates the most important improvements could be done in usability. As we will see in chapter 4 this will be a challenge for developers in the next years. Other important improvements are frequent application updates, an online access or an integrated CRM functionality.

Figure 3.14: Improvement suggestions from participants as a tag-cloud

The results of the question in figure 3.15 are promising for the future. Nearly 90% of the wine-growers can imagine to use further PC technology in the future. This will increase the need of a standardized communication interface.

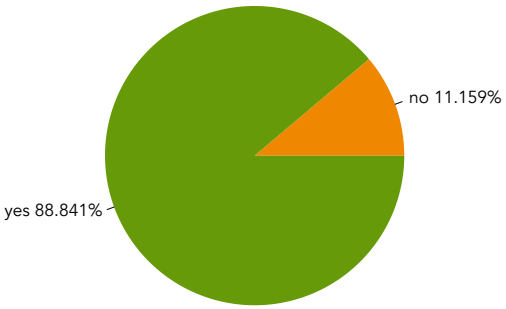


Figure 3.15: Can winemakers imagine to use any new kind of PC system in their winery in the next 3 years? (biased! Please look at the explanations in the beginning.)

Figures 3.16 to 3.23 show the results of questions regarding administrative tasks. Figure 3.16 illustrates how wine-growers prefer to administrate their customer data. Most of them use their CM app, Microsoft Excel/Word, or their e-mail application. About 78% of the survey participants are recording their wine sales data with a computer program (fig. 3.17). The invoices and price discounts are mostly administrated with the CM apps of the wine-growers as we can see in figures 3.18 and 3.19.

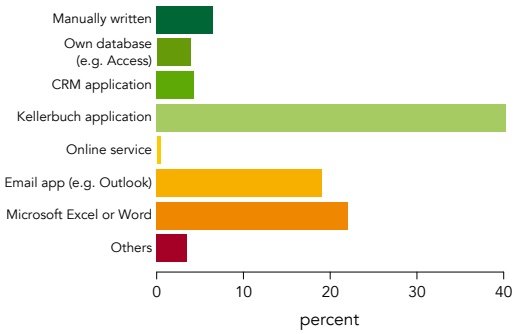


Figure 3.16: Storing customer data on PC

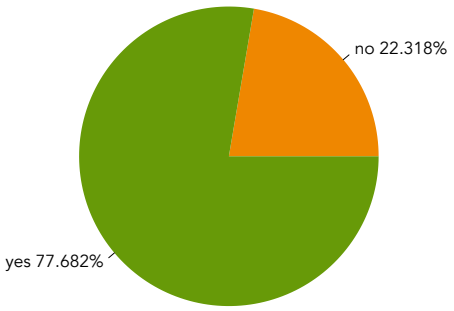


Figure 3.17: Doing sales records with the PC (biased! Please look at the explanations.)

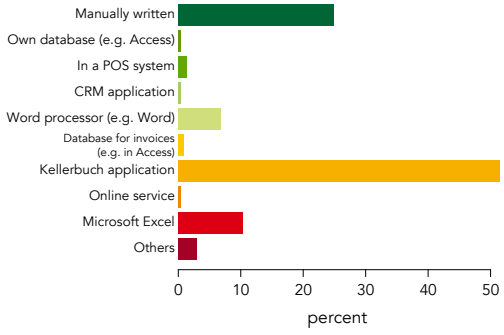


Figure 3.18: Writing invoices with...

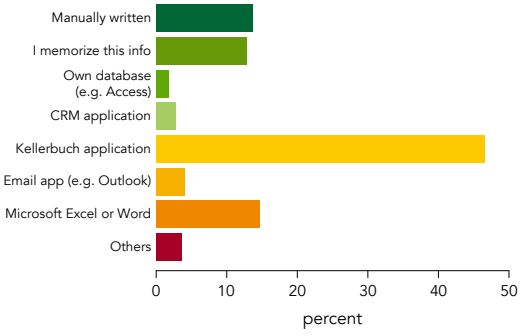


Figure 3.19: Storing price discounts with ...

Roughly 70% of the wineries in Austria have partners or retailers to sell their wines as related to figure 3.20. Most often the partners/retailers are administrated in the CM apps but interestingly about 25% of the wine-growers are administrating the partners and retailers on paper (fig. 3.21). We assume the reason for this is that if different partners have different conditions the wine-growers will feel safer to have this information only on paper.

Figures 3.22 and 3.23 depicts tasks which wine-growers already do on their PC and tasks they will probably do in the future. Administrating customers, prices, invoices and products are the most frequent tasks done on the PC (fig. 3.22). Related to figure 3.23 invoice-, customer- and stock administration are the top planned tasks which will likely be done on the PC in the future.

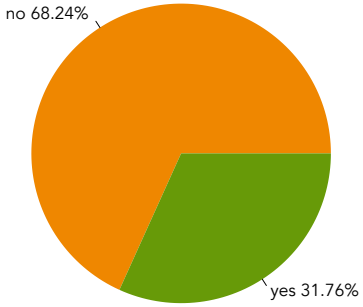


Figure 3.20: Sell via partner/retailer?

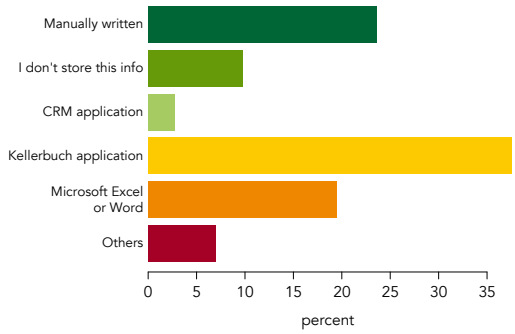


Figure 3.21: Administrate partner sales with ...

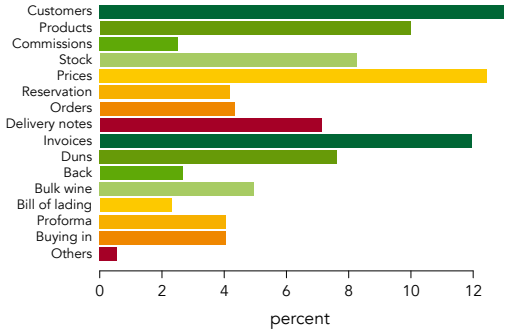


Figure 3.22: Which tasks wine-growers already do with their PC

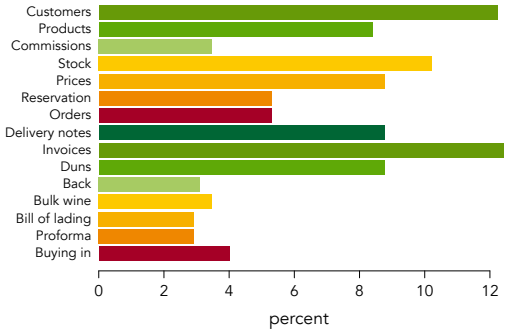


Figure 3.23: Which tasks wine-growers would like to do with their PC

Hypothesis H.A1 **approved**

Wineries are using many computer-supported devices and processes during the wine life-cycle.

Based on our survey we can say that this hypothesis is proved. Relating to figure 3.7 75% of wine-growers already use a CM application. In many areas of wineries (e.g. cellar, tractor, vineyards, ...) computer supported devices are in use relating to figure 3.10. Also many administrative tasks in wineries are done with the help of a computer program (fig. 3.22).

Wein-Online

"Wein-Online" is an e-government application of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water management. Via the application, several administrative reports wineries have to make can be done online. The service has been available since 2002 [26]. Since fall 2013, the usage of the application is mandatory for all wineries producing more than 3000 liters of wine a year. For this reason, one part of the survey covered this issue. Figures 3.24 to 3.28 depict the answers given by the participants.

The main purpose of these questions is to find out what the wine-growers think about using the online service, because we assume that a big part of the wine-growers is against the mandatory use of Wein-Online. We assume so because we think that it probably is too complicated for the older generation of wine-growers. Surprisingly wine-growers are very contented with the application. Roughly 95% of them do the reports on their own (fig. 3.24) and 88.5% found the usage rather easy and practical (fig. 3.25) although a third of the wine-growers is rather skeptical concerning the data security of the application (fig. 3.26). Apart from that, about 61% of the participants believe that using "Wein-Online" has some benefits (fig. 3.27) and most of them (78%) can imagine using the application for more purposes in the future (fig. 3.28).

Hypothesis H.A2	**disapproved**
Wine-makers don't want to use the new online tool Wein-Online.	
Based on the survey among Austrian wine-growers we can clearly disprove this hypothesis. The results in this section prove that wine-growers are satisfied with the tool and think the tool is easy to use. Although a small amount of wine-growers are skeptical concerning data security, the majority sees a benefit in using Wein-Online and wants to use more features of it in the future.	

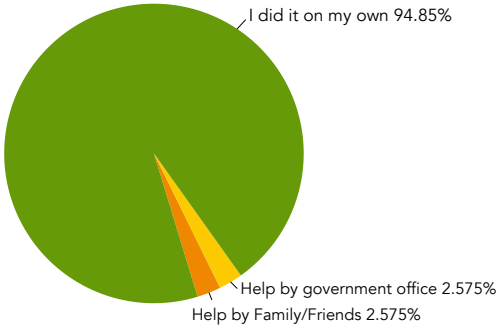


Figure 3.24: Did the winemakers had help using of "Wein-Online"?

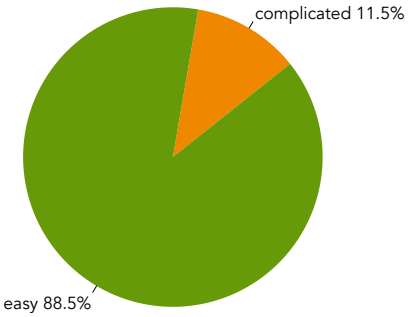


Figure 3.25: Was the usage of "Wein-Online" rather easy or complicated?

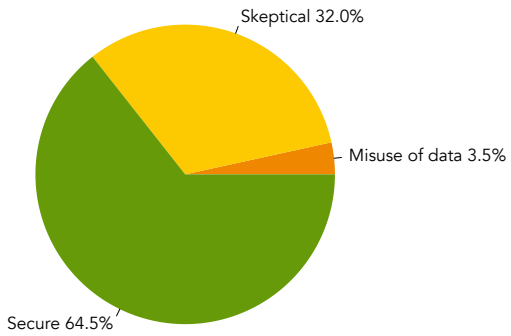


Figure 3.26: Do users trust in the service?

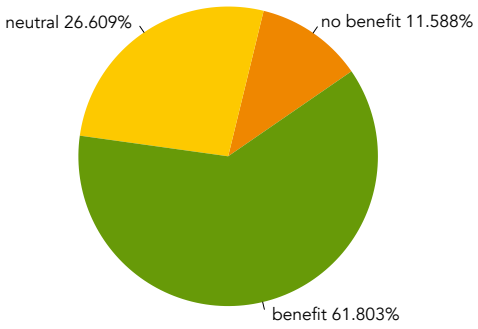


Figure 3.27: Do users see a benefit using "Wein-Online"?

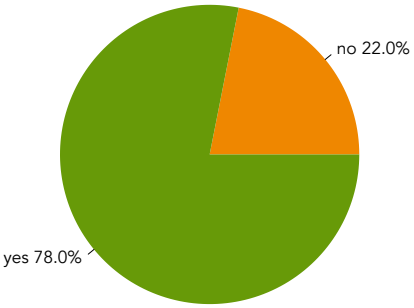


Figure 3.28: Will winemakers use "Wein-Online" beyond the requirements by law?

(E-) Marketing

This part of the survey is all about classic- and electronic marketing in wineries. Which communication and distribution channels are used by winemakers to present their winery and their products?

Figures 3.29 to 3.45 describe the answers found by our survey. It is shown that winemakers use many different channels to increase their sales. The number one marketing channel is the winery's website. Nearly 94% of the wineries use a website to present themselves (fig. 3.29). The other 6% without a website have little computer knowledge to maintain a website, think that a website is too expensive for their winery or see no customer benefits in having a website. Some wine-growers also think that a webshop would lead to an unwanted price transparency (fig. 3.30).

Figure 3.31 shows that over 50% of Austrian wineries send out newsletters to their customers. Most of the wine-growers use their mail client for sending the newsletters. A small part use newsletter tools on their websites or via online services (fig. 3.32).

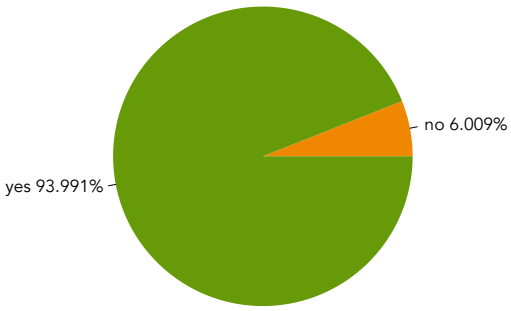


Figure 3.29: Winery has a website.

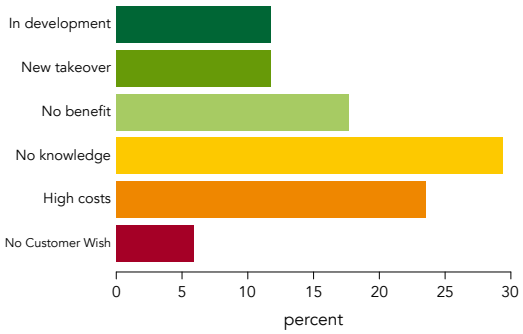


Figure 3.30: Reasons for no website.

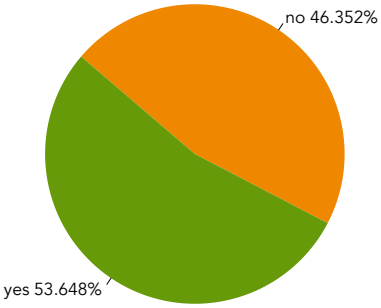


Figure 3.31: Winery sends out newsletters.

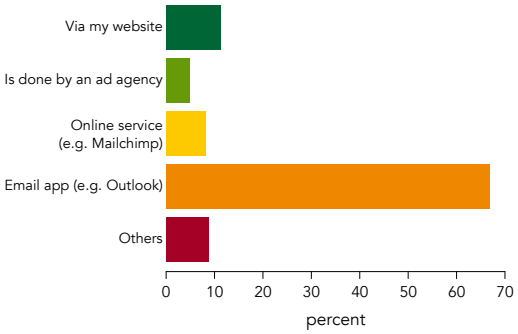


Figure 3.32: Application to create/send the newsletter.

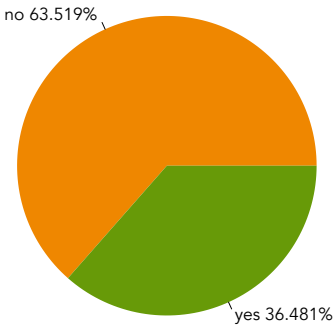


Figure 3.33: Winery has a webshop.

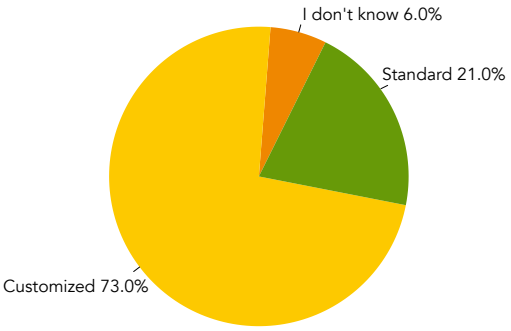


Figure 3.34: Type of webshop.

When looking at figure 3.33 we can see that approximately 64% of the wineries have a webshop for their customers. Most of the webshops are specially customized for the winery and only 21% use just a standard variant of a webshop (fig. 3.34). Typo3, Wordpress or Joomla

are the top webshop systems used by wineries regarding to fig. 3.35. Those who don't have a webshop says that the efforts and costs of implementing and maintaining a shop are too high for them because their customers don't want to buy wines via a webshop (fig. 3.36).

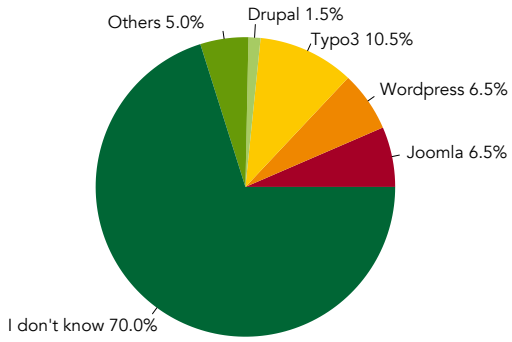


Figure 3.35: Technology of the webshop.

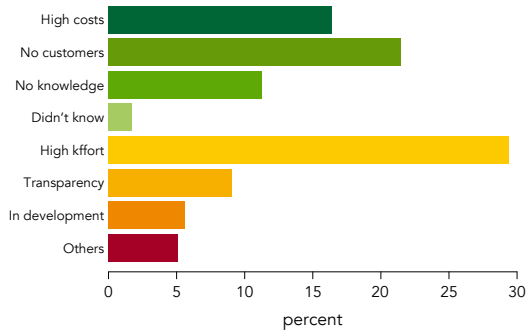


Figure 3.36: Reasons for no webshop

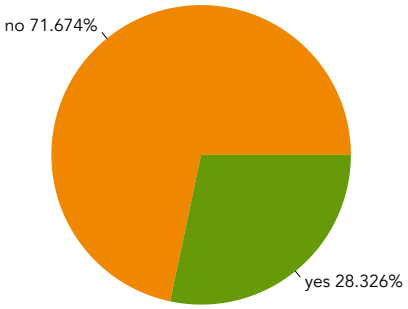


Figure 3.37: Usage of third party webshops

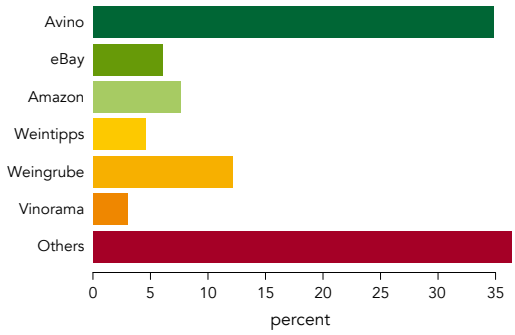


Figure 3.38: Third party webshop vendors

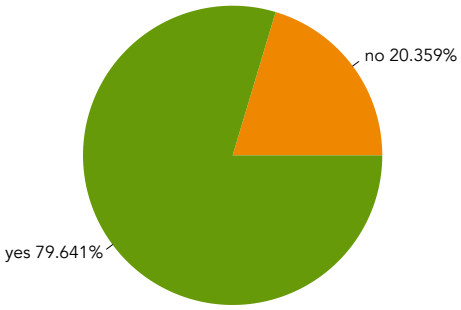


Figure 3.39: Awareness of the possibility of a third party webshop.

An important market sector for our wine data exchange interface are third party shops. It will be very comfortable for wine-growers to upload data about a new wine to third party shops by just one mouse-click from the CM app. Figures 3.37 to 3.39 are related to questions about third party webshops. Roughly 30% of the webshops are third party webshops as shown in figure 3.37. Avino, Weingrube and several others are among the most used shops (fig. 3.38). Figure 3.39 implies that about 80% of the wine-growers know about the possibility of a third party webshop although they are not using one.

Many wine-growers also sell their wines via a partner wine dealer (fig. 3.40). A much smaller part, just 20% of the wineries, also sell their wines via supermarkets. Figure 3.42 shows an overview of the various distribution channels used by wineries. Currently, social media is used rather sparsely (fig. 3.43) but wine-growers plan to increase their e-marketing in the future (fig. 3.45).

Also an interesting question for the WDX interface is the amount of data inputs for the same wine for different marketing purposes. Figure 3.44 shows that wine-growers have to enter the same data 4-7 times in various forms. This unnecessary effort can be avoided if the WDX interface is supported from many platforms in the future.

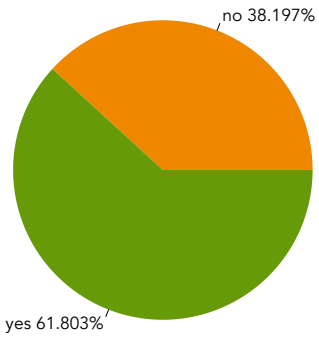


Figure 3.40: Winery has partners/retailers

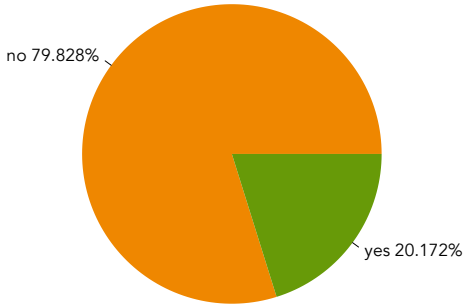


Figure 3.41: Winery is partner of a supermarket

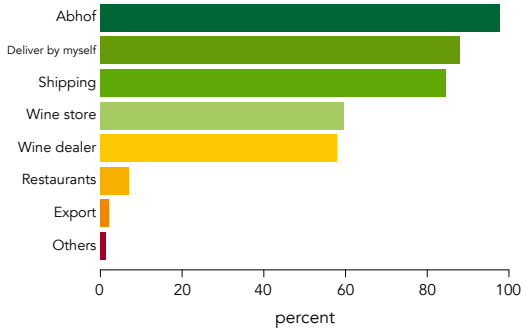


Figure 3.42: Different distribution channels.

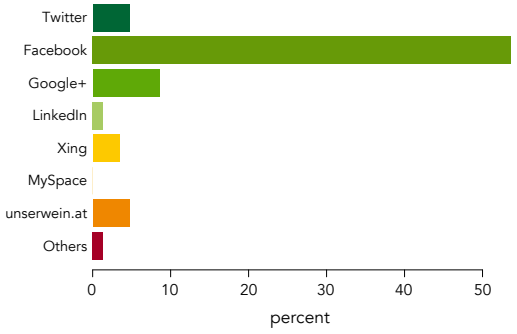


Figure 3.43: Social media usage.

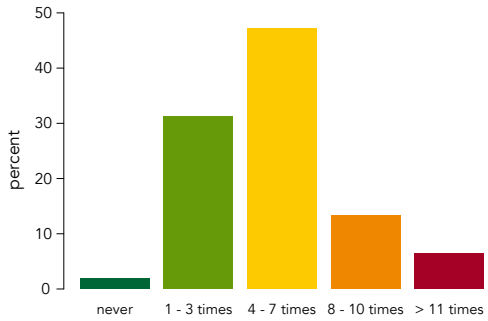


Figure 3.44: Amount of data inputs for the same wine

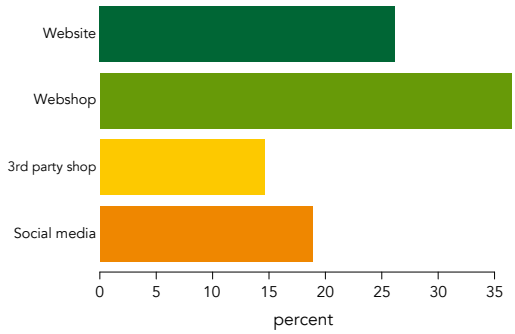


Figure 3.45: Future e-marketing possibilities

Future computer usage scenarios

This section is about the usage of information technology in the next 3 years. Figures 3.46 and 3.47 provide the answers to the questions, whereas fig. 3.46 needs some further explanations. The main question is: *Can you imagine some example future scenarios?*. The subquestions are:

- *Use a cellar management application.*
- *Upload reports to "Wein-Online" via mouse click, without further data inputs.*
- *Upload wine data directly from the ERP system to a webshop just via mouse click.*
- *Automatically filling in forms for wine awards and send them electronically.*
- *Doing sales records on a tablet or smart phone and synchronize data automatically with ERP system.*

The participants have to choose from a Likert scale [42] between "fully applies"(1) and "does not apply"(5). Results are shown in figures 3.46 and 3.47. The next question is addressed to those who rather answer with "does not apply" as the participants are asked for reasons why they answer in a negative way. Automatic product upload to a webshop is the "least imaginary" scenario of wine-growers.

Figure 3.47 shows that those who answer with "no" simply don't want to use technology for the given examples or fear they will lose control about data if everything happens automatically. Others do not trust in new technologies or say that costs for new devices are too high for them. Some wine-growers think that the learning effort for using new technologies is too high or that the size of the winery is too small to invest in many new devices.

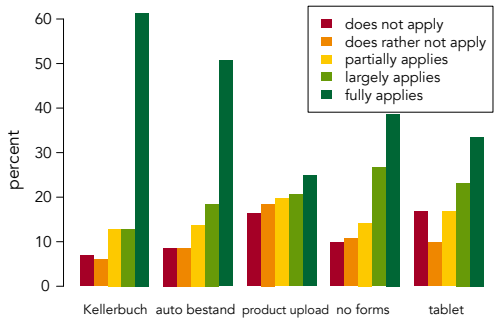


Figure 3.46: Can winemakers imagine to use a ... in the future?

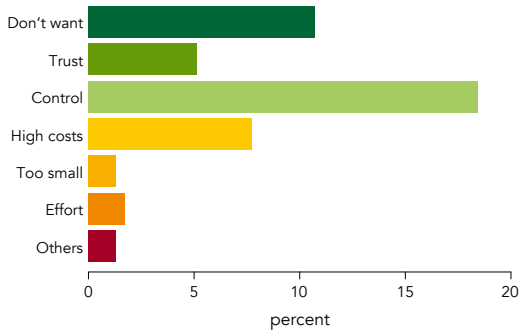


Figure 3.47: Why can’t they imagine to use further technologies?

Hypothesis H.A3 **disapproved**

The skepticism and fear about new technologies is high.

This hypothesis can also be refuted based on the results of our survey. The question “Can winemakers imagine to use more computer technology in the future” has been answered in a positive way by winegrowers (fig. 3.46). Figure 3.47 also illustrates that fears of wine-growers mainly are about loosing control of data but are not very high. Additionally the low skepticism in section Wein-Online relates to low fear of technology in the future.

Data Correlations

Figures 3.48 to 3.52 show some important data correlations of interesting survey question combinations. The calculations and illustrations were made with R (see 3.3).

The first correlation matrix (figure 3.48) illustrates data correlations between CM apps and administrative tasks done with the computer. As you can see it is very likely that administrative tasks will get done with a PC if wine-growers use a CM application. This fact can be seen when looking at the correlations between "Use of CM App" and "Administrative tasks with PC" (A). Looking at the correlations to "Administrative tasks with PC in the near future" (B) reveals rather negative results so we can assume that those questions didn't get answered because wine-growers already use a PC for these tasks. Correlations within "Administrative tasks with PC" and "Administrative tasks with PC in the near future" (E) are low. This gives us the hint that wine-growers who already use a PC for any kind of administrative task would not need to begin using it in the future. But those who are not using a PC for administrative tasks yet and plan to use it in the future, plan to do nearly all the paper work on a PC (D). An interesting correlation can also be seen within the group of "Administrative tasks with PC". If we look at C, we can see that correlations among invoices, duns, orders, delivery notes and reservations are very high. These areas are dependent of each other and if one area is done electronically, it is very likely that the other areas are also done electronically.

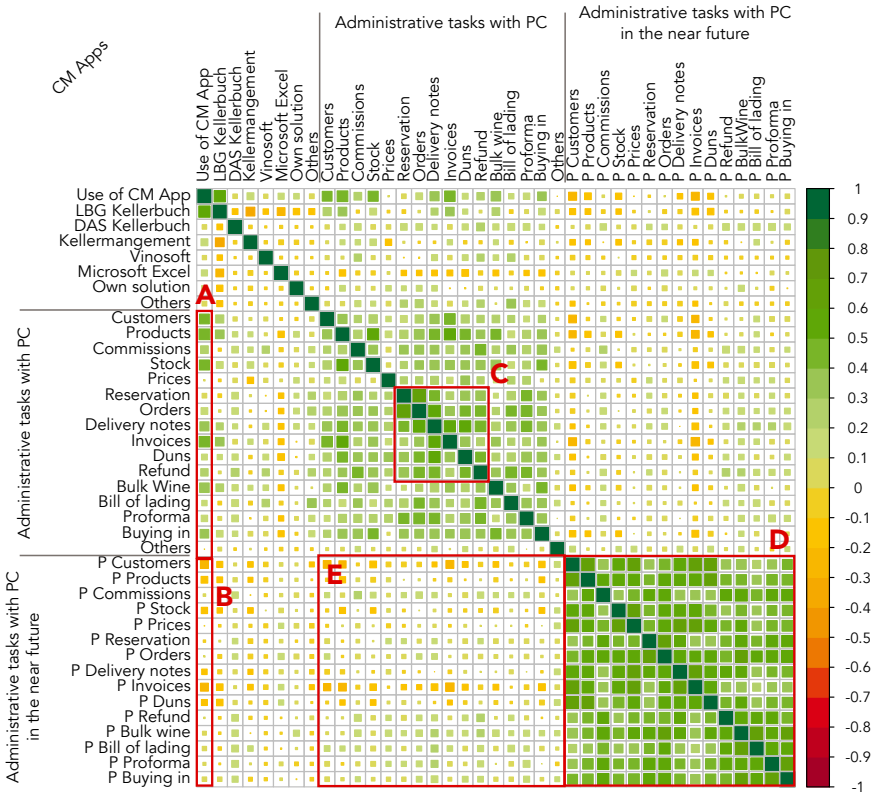


Figure 3.48: Correlations of CM apps and administrative tasks with a PC.

When looking at the matrix in figure 3.49, we do not see as much correlations as in the figure before. We can see that correlations within the field of "CM apps" (A) are solely negative, which is obvious because nobody will use two different CM apps. Correlations within the field of "Computer systems in wineries" (B) are rather positive. We can assume that if wine-growers use modern computerized technologies, they will use them in every area of their winery. Of course correlations between *Cellar & Vineyard* (C) and *Tractor & Farming devices* (D) are rather high because these are areas which affect each other. Interestingly it seems that wine-growers who use the CM apps *LBG Kellerbuch* and *DAS Kellerbuch* (E) tend to use more computer systems in all areas of a winery compared to others. Those two applications are among in the TOP 3 of CM applications in Austria (see Figure 3.8).

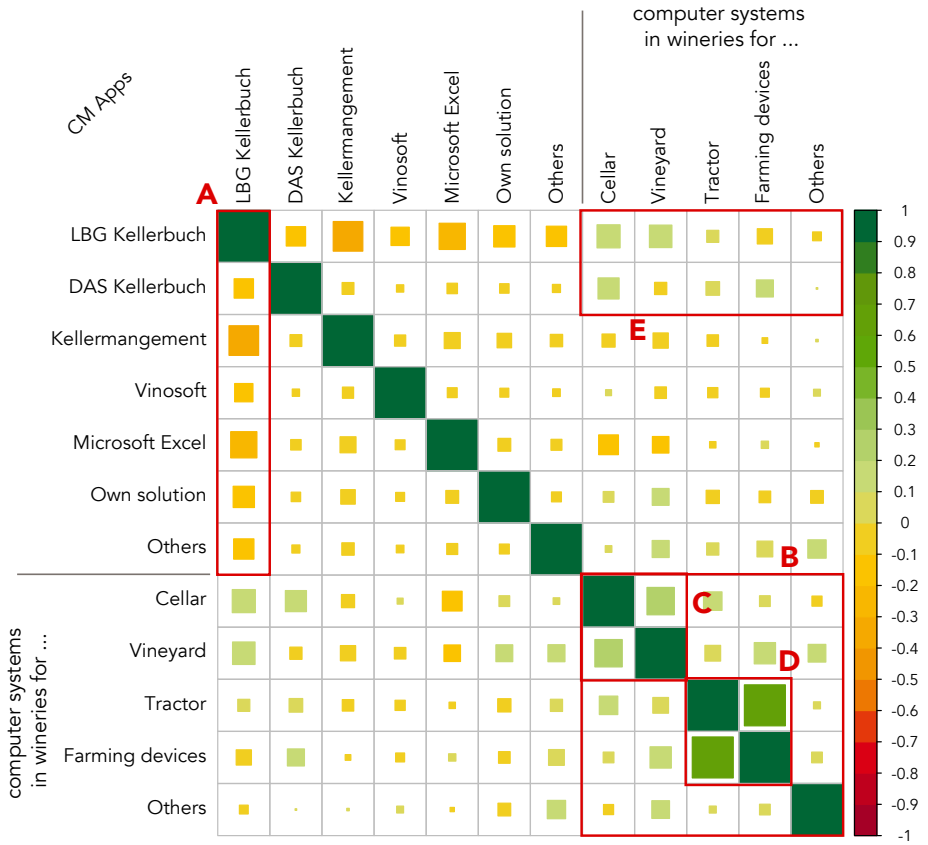


Figure 3.49: Correlations of CM apps and other used systems.

The next correlation matrix in figure 3.50 depicts correlations of reasons and fears wine-growers have when introducing new computer based systems in their wineries. Correlations within the single topics are very reasonable, like for example the *fear of data loss* in "Reasons for no CM App" (A). As a result, saying that the *paper version is better* correlates rather high. In "Reasons for no website" the explanation of *seeing no benefit in a website* correlates with *no customer wish* (B). *No knowledge* and *no benefit* (B) in this topic are also high, which indicates

that wine-growers who have no PC knowledge tend to say a website is no benefit without knowing real facts about e-commerce. Correlations within "Reasons for no website" are not very high, but in C we can see, that missing PC knowledge and no knowledge about the possibility of a webshop correlates high. Another example can be found in "Future PC usage fears": Correlations between winery size (*too small*) and *high effort* (E) are high. Unfortunately we have to say that among the different topics of fears no reasonable explanations could be found. The correlations among them, especially the high ones, seem to be random (G). Interesting correlations can also be seen among "Future PC usage fears" and "Reasons for no CM App" (F). *Less knowledge*, *fear of data loss* and to *prefer paper work* correlates high with *trust in technology, fear of loosing control* and *simple don't want to use a PC*. No correlations can be found in D in "Reasons for no webshop". The reasons in this area does nothing have to do with each other.

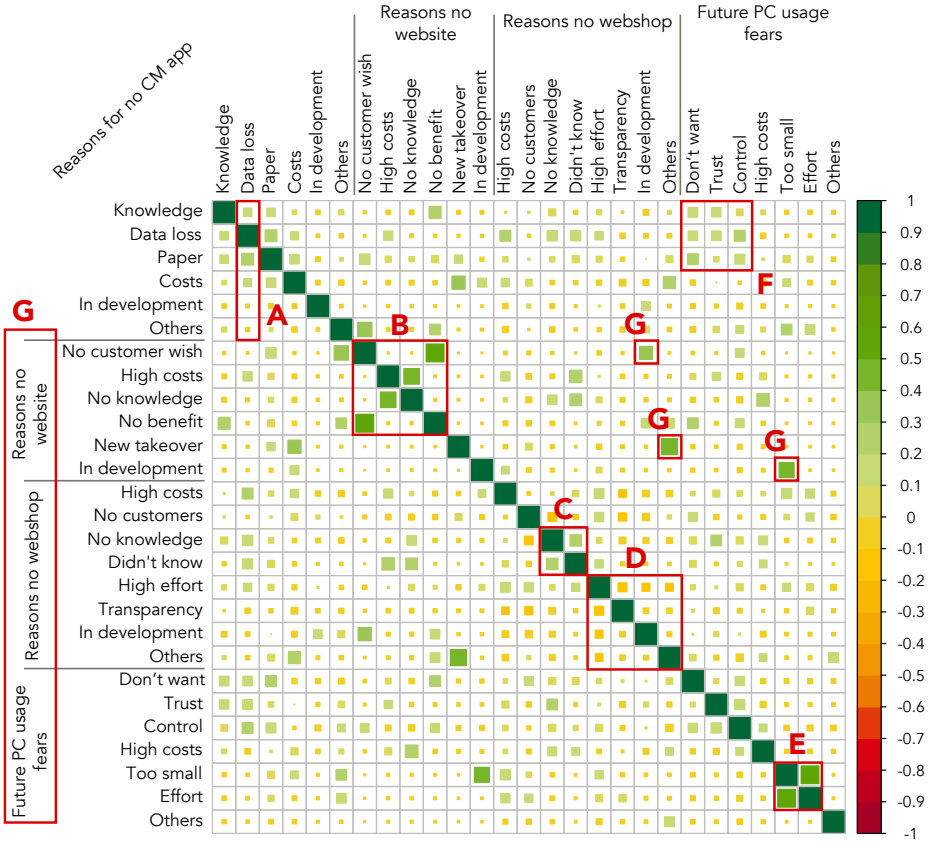


Figure 3.50: Correlations of reasons for no computer usage in wineries.

The fourth matrix in figure 3.51 shows correlations between marketing methods and distribution channels. This matrix is a really interesting one. We can see interesting correlations within the single topics and between them. Correlations within "Selling methods" tend to be very high (A). This means that wineries use more than one distribution channel. They split up the sales to various channels to share the risk. We can see that wineries that use *Amazon* to sell

their wines tend to use *eBay*, too (G). It also shows that social media platforms such as *Facebook*, *Google+* and *LinkedIn* are highly correlated to *Twitter* (C). When looking at D we can see that Facebook is the most used social media platform among the different selling methods. Correlations between *wine stores* and *wine dealers* are also high (F). Correlations between the topics as between "Selling methods" and "Distribution Channels" are even more interesting (E). Wineries with a website tend to ship their wines and sell them also in wine stores and via a wine dealer. Correlations among "Selling methods" and "Third Party Shops" (B) tells us that *Avino*, *Weingrube* and *Others* are the most frequently used third party webshops.

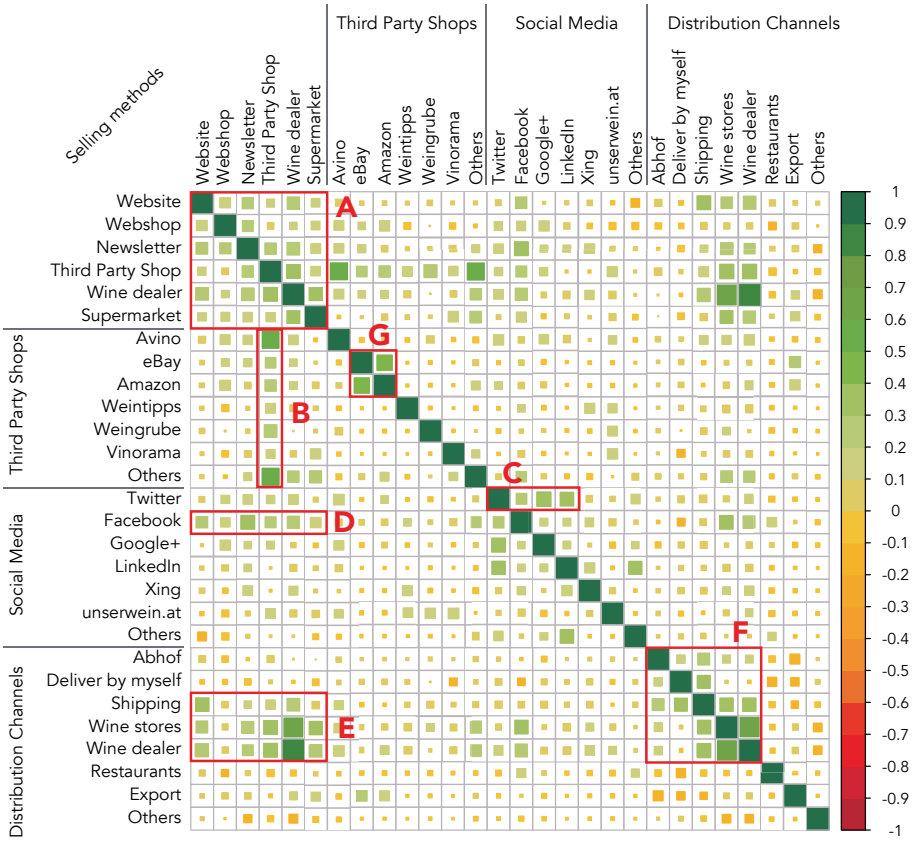


Figure 3.51: Correlations of marketing methods and distribution channels.

In the last matrix (figure 3.52) we tried to find out the costs for the different CM applications. Most of the applications tend to correlate with two price categories. This can be explained by the different modules wineries can buy. The wineries which need more functionality will have higher costs in both categories, basic (B) and annual (D) costs. A good example is the *LBG Kellerbuch*. We can see that initial costs range from € 500 to € 1500 or, in worst case, up to € 2000. The annual maintenance costs are between € 100 and € 500. *DAS Kellerbuch* was programmed for large wineries and therefore the costs are very high. Basic costs range between € 2000 and more than € 3000 (B). Annual costs (D) at more than € 1000 are very high, too.

All relations between basic and annual costs are shown in C. If basic costs are low, annual costs also will be low. Wineries which use Microsoft Excel or their own solutions have low costs but probably don't have many specialized services and features included. Other CM applications might be special software solutions which have high basic costs and rather high annual costs. Part A shows the same information as already seen in figure 3.49. When wineries are using one CM application it is very unlikely to use a second one.

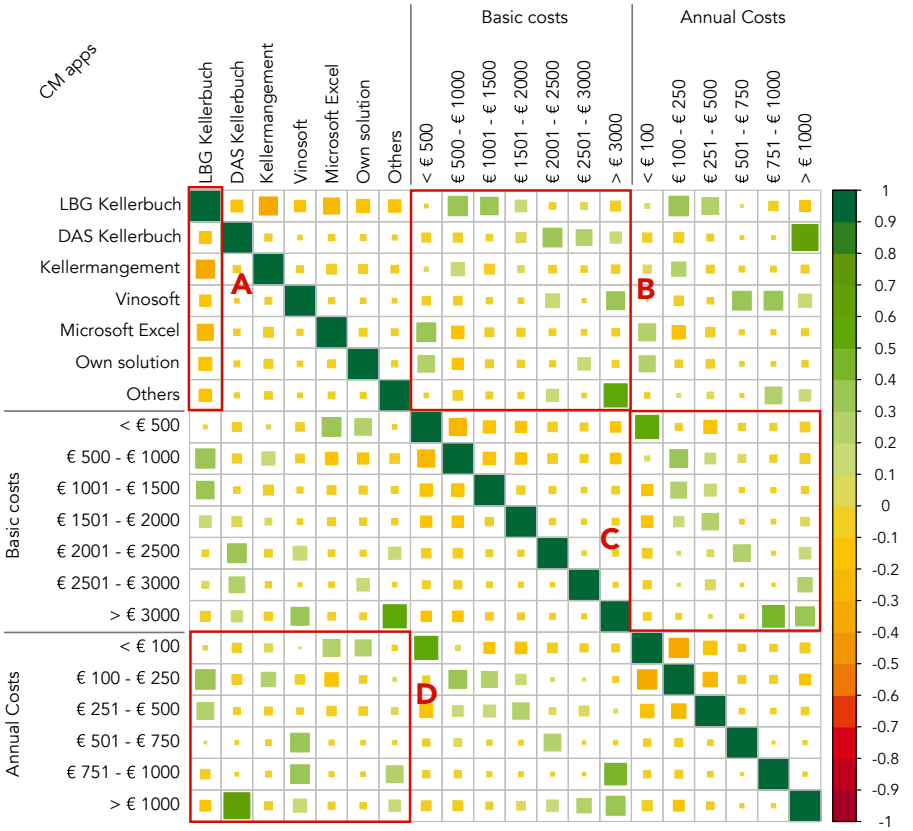


Figure 3.52: Correlations of CM apps and costs.

Learnings

- If a winery uses a CM application, most of the administrative tasks will be done with a PC.
- Most wineries would like to do the administrative tasks with a PC in the future.
- Tractors and farming devices use many IT supported systems.
- Many wine-growers who have no website think that there is no customer wish for a website and they would have no benefit of introducing a website.

- Most wine-growers who do not use a PC for their administrative tasks think, that their winery is too small and the effort is too high for using a PC.
- Wineries use several distribution channels to sell their wines.
- Wineries which own a website tend to ship their wines to the customer.
- Those wine-growers who use Twitter, also use many other social media networks.
- Basic costs of CM applications and annual maintenance costs depend on each other. Applications with high basic costs, also have high maintenance costs.

3.4 Conclusion

Although we had concerns regarding computer usage in wineries in the beginning, the results of our survey are really satisfying. Despite the fact that a few results are biased, we can assume that about 50 % of the Austrian wineries already use computers for various working processes, some in the vineyards and on the tractor, others in the cellar or simply for administrative tasks. Additionally, about 90 % of wine-growers can imagine to use some kind of new PC system for their winery in the next 3 years regarding to figure 3.15.

Many administrative tasks (which we were mostly interested in) are done with the help of various applications by wine-growers. When it comes to e-commerce usage among Austrian wineries, numbers get smaller. Nearly every winery has its own website but only 50 % use newsletters and just a third of wineries has its own webshop. In those areas improvements could be made but some wineries will get new websites, webshops, newsletters or social media any time soon due to being taken over by the younger generation (figures 3.30, 3.36 and 3.45).

Future computer usage scenarios are also answered in a positive way and many wine-growers can imagine to use new technologies and simpler administrative computer supported processes for the future. When it comes to distrust in new technologies, the most mentioned reason is the loss of control, but the percentage of wine-growers distrusting new technologies is rather low.

When looking at the data correlations, we have the impression that the data we gathered and the results are conclusive. Many reasonable correlations between various questions can be found and get explained. Especially the correlations among costs in figure 3.52 are interesting and convincing.

The diversity of applications as seen in the “Use of Computers” section and the willingness of wine-growers to use computer programs for administrative tasks in their wineries is promising for a new standardized communication interface. As we see in section “Wein-Online” the wine-growers are satisfied with new online solutions for governmental tasks to reduce paperwork. Also the usage of e-commerce tools is rather good as we see in section “(E-) Marketing”. Section “Future computer usage scenarios” show a high interest in new technologies for the future. Taking all these trends together, we can conclude that there is an urgent need for a standardized communication interface, such as the WDX Interface, and that it should be established within the next few years.

With the information about CM apps and e-marketing tools we now can go on to the analyses of cellar management applications and winery web fitness. In the next chapter we analyze the top cellar management applications of Austria and one solution from Germany regarding the services & features for administrative tasks the wine-growers do and would like to do as we found out in the survey. For the web fitness analysis we evaluate the websites regarding the information and e-marketing tools they offer for the customers.

CHAPTER 4

Cellar Management Applications

As mentioned in the introduction there are several different software solutions for "cellar management" purposes in Austria and Germany. In this chapter we analyze some applications used in both countries. The research findings are presented in the following sections. The main focus of our research is to identify services and features these applications have in common. In addition we take a look at the user interface and usability of the applications.

Notice: *The term "cellar management application" refers to ERP systems for wineries. The systems mentioned in this master thesis support the administrative tasks for the Austrian "Kellerbuch" and beyond. Examples for other tasks are customer administration, invoice administration and others.*

Limitations: *The analysis in this chapter was only made by one person. This means that all classifications and evaluations were encountered by just one person. For this reason the results of the analysis must be considered as limited.*

4.1 Feature Analyses

Application Selection

On the one hand the selection of the applications is based on the cellar management application usage results of the survey. In figure 3.8 on page 22 you can see, that *LBG Kellerbuch, DAS Kellerbuch/DIE Warenwirtschaft and Kellermanagement(Ing. Mauß)* are the top 3 used cellar management applications in Austria.

On the other hand we want to analyze one application from Germany as well. After some research we think that *Weinbau-Online.de* would be a good choice, not just because it supports the German wine law but also because it is a web based solution. This result in the final list of tested applications:

- LBG Kellerbuch

- DAS Kellerbuch/DIE Warenwirtschaft
- Kellermanagement (Ing. Mauß)
- Weinbau-Online.de

Services & Features

The main focus during the cellar management application evaluation is on identifying services & features cellar management applications have or do not have in common. In order to find out all possible services and features, every application get examined very carefully and most of the features are tested during the research.

Table 4.1 shows a list of services and features the evaluated cellar management applications support. The list doesn't cover every single feature, because otherwise the list would be too long. Therefore most services and features are summed up to general terms. Storing winery data is e.g. summed up in *administrate business data*.

Further the list is split into ten subparts we defined during research. The parts should help to give a better overview of the different aspects of the services/features. The ten parts are:

1. System
2. Common features
3. Communication features
4. Cellar management features
5. Work processes
6. User interface
7. Administration tasks
8. Financial administration
9. Miscellaneous
10. Additional modules

Symbols and abbreviations in table 4.1:

$+$ Full support of the service/feature
$\sim$ Limited support of the service/feature. Further explanations in *Additional Information*
$-$ Service/Feature not supported

LBG LBG Kellerbuch
DKB/DWW DAS Kellerbuch / DIE Warenwirtschaft
KM Kellermanagement (Ing. Mauß)
WO Weinbau-Online.de

Services / Features	Application				Additional Information
	LBG	DKB / DWW	KM	WO	
Country	Austria	Austria	Austria	Germany	
System properties					
Technology	unknown	Java	unknown	PHP, JS	
Online service	−	+	−	+	
Can run on an internal server	+	+	−	−	
Offline version	+	∼	+	−	DKB: If one will run it on an inhouse server it can be reached without an internet connection
Usage on tablet possible	−	+	−	+	
Device independent	−	+	−	+	
Common Features					
Administrate business data	+	+	+	+	
Store different wines	+	+	+	+	
Administrate wine cellars	+	+	+	+	
Administrate tanks	+	+	+	+	
Administrate bottles wines	+	+	+	+	
Administrate vineyards	+	+	+	+	
Administrate variety of wines	+	+	+	+	
Buy grapes from third parties	+	∼	+	∼	DKB: You need the module DIE Traubenannahme. WO: One can define a process to buy grapes. But there is no standard possibility for this.
Buy wine from third parties	+	+	+	∼	WO: One can define a process to buy wine. But there is no standard possibility for this.
Communication Features					
Integrated e-mail client	+	−	−	+	
Excel exports	+	+	−	∼	Only few Excel exports are possible. Most things like statistics can only be shown online.

Services / Features	Application				Additional Information
	LBG	DKB / DWW	KM	WO	
PDF exports	+	+	+	+	
Print exports	+	+	+	+	
Direct communication with printer	+	−	+	−	
Communication with web-services e.g. a webshop	−	∼	∼	+	DKB: There is only a way to communicate between DAS Kellerbuch and DIE Warenwirtschaft. KM: You can export a file with your wine data. If your webshop supports this file, you will be able to upload it.
Cellar Management Features					
Task protokoll	+	+	+	+	
Task history	+	+	+	+	
Task list exports	+	+	−	+	
All needed working tasks exist	+	+	+	+	WO: Only for Germany
Support for Austrian wine law	+	−	∼	−	
Support for German wine law	−	−	−	∼	WO: Only full support for wine law in Rheinland-Pfalz, Hessen and Baden-Württemberg
Edit record	+	−	−	∼	WO: Editing is not possible in all masks
Delete record	+	+	+	+	
Work Processes					
Cleaning protocol	+	−	−	−	
Erntemeldung	+	+	+	+	
Bestandsmeldung	+	+	+	+	
Treatment product administration	+	+	+	+	

Services / Features	Application				Additional Information
	LBG	DKB / DWW	KM	WO	
User Interface					
Menu icons	+	−	+	+	
Graphical display of tanks, cellar, ...	+	−	−	−	
Support for corporate identity	+	+	+	+	
Usability	+	−	∼	+	
Administration Tasks					
Customer administration	+	+	+	+	
Supplier administration	+	+	+	+	
Staff administration	−	−	−	+	
Merchants administration	+	∼	+	∼	DKB & WO: Merchants can only be defined via customer type.
Sensal administration	−	+	+	−	
Administrate trading units	+	+	+	∼	WO: Autocompletion for all different trading unit size entries in the database is added automatically. So you cannot explicitly define trading units.
Different price lists	+	+	+	+	
Order administration	+	+	+	+	
Store various shipment methods	+	+	+	−	
Store various delivery conditions	+	+	−	−	
Tour planning	+	+	+	+	
Car administration	+	−	+	−	
Warehouse administration	+	+	+	+	
Financial Administration					

Services / Features	Application				Additional Information
	LBG	DKB / DWW	KM	WO	
Date of payment for customers	+	+	+	+	
Cashback support	+	+	+	+	
Different VAT rates	+	+	+	+	
Store different account data	+	+	+	+	
Financial accounting interface	+	+	+	+	
Invoices	+	+	+	+	
Delivery notes	+	+	+	+	
Duns	+	+	+	+	
Bill of lading	+	+	+	+	
Accounting years	+	+	+	+	
Miscellaneous					
All kind of statistics (sales, ...)	+	+	+	+	
Search (all kinds of things)	+	+	−	+	
Import of old data (external app)	+	+	+	+	
Write form letters or regular letters	+	−	+	+	WO: Winemakers can also use an external service to send postal letters to their customers. Of course they have to pay an extra fee when using this service.
Additional Modules					
POS system	+	+	−	+	
Webshop integration	−	−	−	+	
Number of features	**65**				
Sum full support	57	48	46	48	
Sum limited support	0	4	3	7	
Sum no support	8	13	16	10	

Table 4.1: Cellar management applications feature matrix

Hypothesis H.B1	disapproved
Cellar Management Applications do not provide enough features for sufficient use in a winery.	
Our services & features evaluation disprove our hypothesis. CM applications offer plenty of features for users. Nearly every administrative task can be done via the CM app. The currently missing feature is a communication interface for other applications.	

4.2 Usability Analyses

Analyzing specific software regarding the usability is difficult and in most of the cases not objective as opinions are subjective depending on the tester. Nevertheless, we take a look at the usability of those applications because many participants in the survey suggested that the usability of cellar management applications should be improved (see the improvement suggestions tag cloud in figure 3.14 on page 24).

For our usability analyses we use an inspection method in which domain experts are put in the role of a user. The experts go through every possible function a software application offers and evaluate the application with the help of pre-defined heuristics (also see *Related Work*). The heuristics the experts have to follow should ensure objective evaluation results.

One important thing has to be mentioned. Speaking of usability, most of us think of well designed websites or tablet applications nowadays. Yet, one cannot compare the usability of a website, that users normally check out for a few minutes and have to find all information they want with the usability of an ERP system which users work with for hours on a regular working day. Using these two types of programs is completely different. Websites are mainly used for retrieving information while enterprise resource planning systems are used, as their name implies, for enterprise resource planning, a rather complicated task for which many databases and calculations are needed and usability focuses not just on the look and feel of the design.

10 Usability Heuristics

As mentioned above, a method to test usability in an objective way is to follow pre-specified heuristics during the testing phase. An example for such heuristics will be the DIN EN ISO 9241-110 standard [25]. This standard describes the ergonomics of human computer interaction part 110, for example, describes seven dialogue principles an application should follow to be usable.

For our studies we follow the 10 usability heuristics defined by the usability expert Jakob Nielsen in his works in 1990 and 1994 [34, 36–38]. He reformulated his heuristics in 1995 as the following [35]:

Visibility of system status The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

Match between system and the real world The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. It should follow real-world conventions and make information appear in a natural and logical order.

User control and freedom Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

Consistency and standards Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

Help users recognize, diagnose, and recover from errors Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

Error prevention A careful design which prevents a problem from occurring in the first place is even better than good error messages. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

Recognition rather than recall Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

Flexibility and efficiency of use Accelerators - unseen by the novice user - may often speed up the interaction for the expert user so that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

Aesthetic and minimalistic design Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

Help and documentation Even though it is better when the system can be used without documentation, it may be necessary to provide help and documentation. Any information should be easy to find, focused on the user's task, list concrete steps to be carried out, and not be too large.

Analyses Results

The analyses results based on the 10 heuristics above are shown in the list below. You can look up various screenshots for every application in appendix B.1. There different screenshots of various usage scenarios, as for example products administration, customer administration or error messages which are available for every application are shown.

Visibility of system status

Every CM application keeps the user informed about the current task and state of the application, either through feedback in info dialogues or through direct feedback like showing a new entry in a list immediately.

Match between system and the real world

LBG Kellerbuch, DAS Kellerbuch and Kellermanagement: These three applications fulfill the heuristic for the Austrian wine market. The language used in the applications is the language that wine-growers speak. The services & features of the apps are built the way wine-growers need them.

Weinbau-Online.de also fulfills the heuristic for the German market. The explanation will be the same as for the other three applications.

User control and freedom

LBG Kellerbuch, DAS Kellerbuch, Weinbau-Online.de and Kellermanagement fulfill the heuristic partially. Although one can cancel every task one started, there is no undo or redo possibility. Yet, one can delete wrong records and enter new ones.

Consistency and standards

All applications are consistent regarding their language. The same terms and words are used, if they mean the same. No term has different meanings.

LBG Kellerbuch uses the terms and standards of Microsoft Windows™. Particularly the menu is really good, because it is built like the menu of Microsoft Office 2010™. Users who know the Office Suite probably won't have problems with the menu of LBG Kellerbuch.

DAS Kellerbuch is an online service that rather follows guidelines of Microsoft Windows™.

Kellermanagement also uses terms and standards of Microsoft Windows™. It is not as modern as the LBG Kellerbuch.

Weinbau-Online.de is an online based service and follows rules and standards of a website.

Help users recognize, diagnose, and recover from errors

LBG Kellerbuch, DAS Kellerbuch and Kellermanagement partially fulfill this heuristic. Sometimes we get a clear specified error message and we know what to do. In other situations we just see the error code and don't get any information about the error at all.

Weinbau-Online.de does not produce errors at all. It just gives warnings, if, e.g., a price is not defined. Those warnings are always clearly explained to the user and in most of the cases occur directly in the position where the problem can be solved.

Error prevention

LBG Kellerbuch, DAS Kellerbuch and Kellermanagement have their problems with error prevention. At some points during the testing phase, errors occurred unexpectedly. If that happens, nobody knows why there is an error, or how it would have been possible to prevent the error.

Weinbau-Online.de fulfills this heuristic brilliantly. During the whole testing phase it wasn't possible to generate an unexpected error. If, for example, something mustn't be deleted there is no delete-button, so we cannot produce an error.

Recognition rather than recall

LBG Kellerbuch, Kellermanagement and Weinbau-Online.de provide autocompletion in nearly every text field of a form. So we don't have to know all our codes for wines, tanks and so on. If we know them, we can accelerate the process.

DAS Kellerbuch does not provide autocompletion at all. In nearly every text field you have to remember some shortcut or article code. It is possible to search for the code one needs but you have to click a few times to get where you want. Autocompletion would ease the problem.

Flexibility and efficiency of use

All applications can be used with shortcuts, or be configured in order to be faster in usage.

Aesthetic and minimalistic design

LBG Kellerbuch, Kellermanagement and Weinbau-Online.de are well designed for their purpose of use.

DAS Kellerbuch is designed very minimalistic. There are nearly no icons so the menus are just "lists of text". Some may like it, some not.

Help and documentation

All applications provide help and documentation in various types. They have phone support, a user guide, online support and a documentation available.

Hypothesis H.B2	**approved**
There is a lack of usability in cellar management applications.	
As desired by the customers in the wine survey the usability of cellar management applications should be improved massively (fig. 3.14). Also our usability evaluation of CM apps had average results. Most of the evaluated usability heuristics are only fulfilled partially. For these reasons we can prove this hypothesis.	

Hypothesis H.B3	**approved**
The concepts how data is entered in the applications are old-fashioned.	
This hypotheses can be proved based on our CM application analysis. During the evaluation we tested many forms for data inputs. Most of them are rather complicated and ranges over more than one page. Many of these forms could be drastically improved and simplified with the help of modern usability concepts.	

4.3 Ranking

Taking all analyses into account and assigning 1 point for full support, 0.5 points for limited support of a service/feature the tested application offer, and 1 point for every usability heuristic they follow, the applications score following points:

Category	Points for Application			
	LBG	DKB/DWW	KM	WO
Full services/features support	57	48	46	48
Limited services/features support	0	2	1.5	3.5
Visibility of system status	1	1	1	1
Match between system and the real world	1	1	1	1
User control and freedom	0.5	0.5	0.5	0.5
Consistency and standards	1	1	1	1
Help users recognize, diagnose, and recover from errors	0.5	0.5	0.5	1
Error prevention	0	0	0	1
Recognition rather than recall	1	0	1	1
Flexibility and efficiency of use	1	1	1	1
Aesthetic and minimalistic design	0.5	0.5	0.5	0.5
Help and documentation	1	1	1	1
Sum points	**64.5**	**56.5**	**55**	**60.5**
Final Rank	**1**	**3**	**4**	**2**

Table 4.2: Assigned points and final ranking for the tested cellar management applications.

The results of this ranking have to be considered as limited. Please refer to page 41.

Interpretation of rankings

1. **LBG Kellerbuch (64.5 Points):** The LBG Kellerbuch is a recommendable software package for a winery. Features/Services which are needed by a winery are supported. A POS system can be integrated and it can be executed on a server. Unfortunately LBG does not support full tablet usage yet.

2. **(Weinbau-Online.de (60.5)):** Despite the fact, that Weinbau-Online.de just supports the German wine market so far, the application deserves rank 2. Because it is a fully online based service, it can be used on a tablet, too. It may not be optimized for its smaller display but offers full functionality on a tablet. A POS system can also be integrated and the user interface is really a success.

3. **DAS Kellerbuch (56.5):** DAS Kellerbuch connected to the module DIE Warenwirtschaft supports everything a wine-grower needs, but it is far too complicated to use. It is an

online based service and can be used with a browser on a tablet but there is no tablet optimization which leads to a rather bad user experience. No autocompletion in text fields and many article codes a user has to remember put DAS Kellerbuch in third place.

4. **Kellermanagement (55):** Although Kellermanagement supports all services/features needed, its technology is far too old. There is no possibility of using it on a tablet, it cannot be used in combination with a POS system and the user experience reminds of operating the old Windows XP™.

4.4 Future Improvement Desires

We think many improvements can be made in every CM application we evaluated. Not so much in the field of the features but in the aspect of usability. Every application supports every needed service/feature wine-growers need to do their daily business. Speaking of usability, the applications can be improved in many ways.

Design Enhancements

First the graphical user interface (GUI) design of the applications should be improved. LBG Kellerbuch and Weinbau-Online.de have a quite good GUI but some refreshing changes in a more modern way would be nice. DAS Kellerbuch and Kellermanagement really need some concept changes regarding the design. Both are rather hard to use due to the GUI design. We would suggest to reconsider some forms and input masks in a way that the user can do processes more easily and faster. If you want to enter a working task in the "Kellerbuch-Journal", for example, it takes 6 steps in 6 input masks. With a good GUI design, this task would be possible in 1 input mask.

Mobile Device Support

Mobile device support will be an important thing to improve. Due to tablets and smartphones many administrative tasks wine-growers need to do could be done on the fly during work in the cellar or in the vineyards. We do not think every single feature the applications have should be supported by the mobile device but a well-considered set of features would be nice. For example it could be useful if wine-growers were able to update their work protocol on their tablet PC while working in the cellar. Updating their bottle stocks directly while bottling would be practical, too. This, of course, also means a move towards online based solutions like Weinbau-Online.de or towards cloud solutions.

4.5 Conclusion

Cellar management applications provide many services & features for the wine-growers and meet nearly all needs a wine-grower could wish for. All important and also not important administrative tasks could be done with one of the evaluated cellar management applications. Of course there are slight differences in functionality, but at large all needs are covered by the services & features of the applications.

Speaking of the usability of the programs the results are not as satisfying as with the services and features. We evaluated the usability with the help of 10 usability heuristics [35] but unfortunately the results were only average. Mobile user interfaces, error recognition and error prevention are the biggest problems of usability.

With the knowledge of the data which can be stored within the cellar management applications, we know can go on to the web fitness analysis. In this chapter we analyze the websites regarding the information they offer for the customers. It will be interesting to see if similar information about wines and wineries as in the cellar management applications is available on the wineries websites.

CHAPTER 5

Winery Web Fitness

A majority of Austrian wine-growers use their websites as their single online marketing strategy. Wineries therefore have different types of websites. Most of them are only for marketing purposes but some have integrated web shops, newsletters and social media, too. In this chapter of the thesis some of these websites get analyzed regarding their web fitness (see section 5.1) to see which information customers can find about the wineries and the wines. But the analysis is not just about the information customers can find on the websites. It also should help to find concrete parts of information every winery offers and therefore is important for the WDX interface. Moreover the technology wineries use for their websites get analyzed. So we can see if our interface can also be included in some webshop technologies.

The further purpose of the web evaluation is to conclude how "fit" wineries are in the new media. In the following sections of this chapter the term web fitness, the approach, the website selection criteria and the results of the evaluation process get explained.

Limitations: *The analysis in this chapter was only made by one person. This means that all classifications and evaluations were encountered by just one person. For this reason the results of the analysis must be considered as limited.*

5.1 Web Fitness Analysis

Due to the fact that websites are the single online marketing strategy for most of the Austrian wineries, we want to know how "fit" the wine-growers and their websites are for modern e-commerce processes. As mentioned in the chapter description above, the web fitness analysis of wineries means analyzing their websites regarding the contents, information offers, social media, web 2.0 and more. The main purposes of the web fitness analysis are:

- Gather general knowledge about information wineries offer for their customers, or if it will be easy for customers to find information about the winery.

- Are there just marketing websites, or do they offer e-commerce features such as a webshop as well?
- Quality of design and contents regarding their structure and device compatibility.
- Do wineries seem "fit" for using the new media and new communication channels? Would the usage of our Wine Data Exchange Format be appropriate?

5.2 Website Selection and Approach

Website Selection

For our evaluation we select 100 different winery websites to look at. To get a representative sample of winery websites we calculate the percentage of wine-growing region sizes in Austria, so we get the number of websites we have to analyze for every wine-growing region. This results in the distribution listed in table 5.1. Then we randomly choose the web addresses from wineries. The exact wineries we choose for testing are listed in table A.16 in the appendix.

Website Distribution			
Region	**Area (ha)** [3]	**%-Share**	**Number of Websites**
Weinviertel	13,356	29.12	29
Kamptal	3,802	8.29	8
Kremstal	2,243	4.89	5
Wachau	1,350	2.94	3
Traisental	790	1.72	2
Wagram	2,451	5.34	5
Thermenregion	2,196	4.79	5
Carnuntum	910	1.98	2
Neusiedlersee	7,649	16.68	17
Neusiedlersee-Hügelland	3,576	7.80	8
Mittelburgenland	2,117	4.62	5
Südburgenland	498	1.09	1
Süd-Oststeiermark	1,400	3.05	3
Südsteiermark	2,340	5.10	5
Weststeiermark	500	1.09	1
Wien	612	1.33	1
Others	80	0.17	0
Sum	**45,870**	**100**	**100**

Table 5.1: Number of winery websites per wine-growing region we have to analyze.

Approach

Testing websites can always be problematic because one might think the evaluation process is rather subjective than objective. As explained in the *Related Work* it is kind of problematic to find an evaluation process which is subjective in many cases.

So we decided to test the websites in the categories *Winery Size*, *Technology & Services*, *Information*, *Search Engines* and *Browser Support*. These categories are objective and straight forward. We checked whether a feature/service is supported/provided by the website or not. Further we rate the websites *Look & Feel*. This category, unfortunatelly, is rather subjective.

Apart from that we also test the winery websites with the automatic website testing tool *Nibbler*[1].

In all these categories one important category is missing: *community features* such as discussion forums or review systems in web shops. Unfortunately wineries have not implemented such features in their websites yet.

Category Explanations

Winery Size

All Wineries are classified into the groups Small[S], Medium[M], Large[L], X-Large[XL], XX-Large[XXL] depending on their total size. This information can be found on their websites. The limits for the classifying process are the following:

Small	$< 10 hectares$
Medium	$(10, 20] ha$
Large	$(20, 30] ha$
X-Large	$(30, 40] ha$
XX-Large	$> 41 ha$

Except from these boundaries there are some wineries which slid up into the next higher class because they almost reach the class limit and have a high reputation or some kind of additional service like a restaurant included.

Technology & Services

In this category the websites get analyzed to answer the following questions:

Do the wineries use a **CMS**? If yes, which one do they use?
Do they have a **favicon**?
Does the user need a **flash** player on the website?
Are there some kind of picture **galleries**?
Will the user be able to change the **language**?
Does the user have the possibility to change the **font size**?
Does a **mobile version** for the website exist?

General Information

This category is all about the information on the winery a user can find when looking at the website. Is there information about the **winery**, **vineyards & varieties**, **region** or is there

[1] http://nibbler.silktide.com

a section with **news**, **press information** and **downloads**? Can the customer subscribe to a **newsletter** or does the winery present itself on **social media**, such as Facebook or Twitter? Is there some **other kind of interesting information** like e.g. an included restaurant or *"Heurigen"*.

Product & Sales Information

What information about products & sales is offered by the website? Is there information about the **wines** one can buy, about the **prices** and the way one can buy these? Does the winery have a **webshop**? Do they offer just an **order form** or the possibility to **order via email**? Can the customer find information about **shipping charges** or other **conditions** bound to an order?

These questions are answered in this category.

Legal Info

The Legal Info category should answer the questions: Which **contact information** is available? Does the winery offer a map or a sketch of their position? Does the website include an **imprint** or **terms & conditions**?

Look & Feel

This is the only subjective category in our test. The **design** and the **contents** of the website get evaluated from **good to bad in five steps** (good, rather good, neutral, rather bad and bad), whereas the content isn't evaluated in the sense of wording but in the way of its style and layout.

Search Engines

We search for the winery names in different search engines such as *Google*, *Microsoft Bing* and *Yahoo!* to find out the search ranks they have. Notice that we don't analyze the Search Engine Marketing of wineries. The search rankings just represent the result position after searching for the name of the winery.

Browser Support

Every website get evaluated regarding its compatibility in *Internet Explorer*, *Apple Safari*, *Google Chrome* and *Mozilla Firefox*. The result of 100 % cross browser compatibility is far better than expected. (Browser versions during tests: IE 11, Chrome 36.0.1985.143, Firefox 29.0.1, Safari 7.0.6)

Nibbler

Nibbler [50] is an automated website testing tool. Nibbler tests website in the following categories: analytics, facebook page, incoming links, printability, feeds, semantic HTML, W3C compliance, meta tags, links, visual interest, URL format, social media, alternative text, headings, images, popularity, inoffensive content, titles, facebook sharing and duplicate content. These topics are summarized in an average test result and into four categories:

Accessability	How accessible is the website to mobile and disabled users?
Experience	How satisfying is the website likely to be for users?
Marketing	How well is the website marketed & how popular is it?
Technology	How well designed and built is the website?

Every Topic/Category is rated on a scale from 0.0 (not good) to 10.0 (very good).

5.3 Results

In the following sections *Descriptive Evaluation* and *Correlations* the results are explained. The first section describes the outcomes of different analyses categories. The second section explains some data correlations.

Detailed web fitness analysis data can be found in appendix A.2 from table A.16 to table A.20. The data was imported in R[2]. All calculations, evaluations and plots have also been made with R.

Descriptive Evaluation

The pie chart in figure 5.1 illustrates the shares of winery sizes of the tested websites. Two thirds of the pie represent small to medium sized wineries and one third represents the bigger wineries. This reflects the Austrian winery structure quiet well. Nearly three quarter of those websites are only available in German, which is shown in figure 5.2. A quarter also offers English as a second language and a very small part also offers Hungarian and Czech. From an international market point of view this is a rather bad result.

Figure 5.3 depicts which technological features like favicon, flash, galleries, possibility to change the font size and a mobile version, the websites use. The red bar illustrates the share of websites with a mobile versions. Less than 10 % of the websites support mobile devices. This is a rather bad number. Apart from that, only about 15 % use flash on their website so in most of the cases a tablet PC or any other mobile device will display the website correctly. Displaying the website will just be more inconvenient for the user. Nearly 50 % uses picture galleries to present their winery. From a user point of view we think this is very nice because the user can see what the winery looks like. Beside of that, one third of websites have a favicon which is great when the link is stored as a favorite. Almost none of the websites offers the possibility to change the font size on the website.

Notice: *Bar plots do not have to sum up to 100 %. Due to space limitations we combined some of the bar plots.*

[2] R is a free software environment for statistical computing and graphics. `http://www.r-project.org`

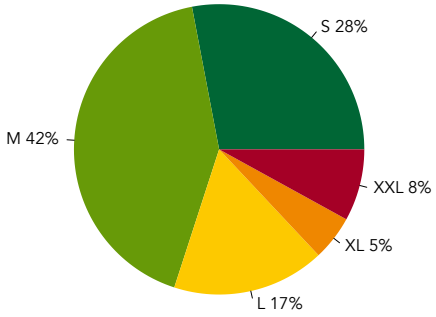


Figure 5.1: Winery sizes

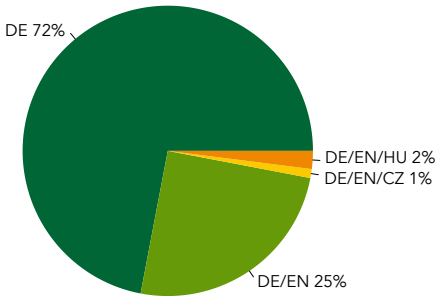


Figure 5.2: Language support

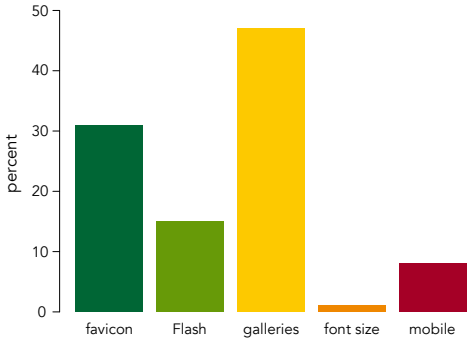


Figure 5.3: Technology related topics

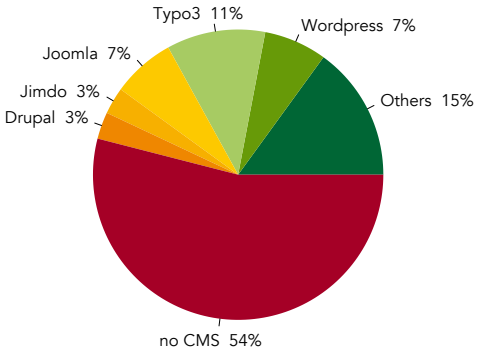
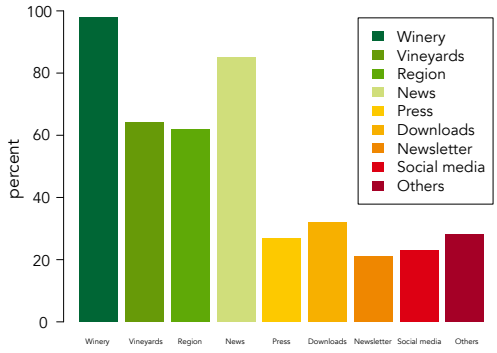


Figure 5.4: CMS usage

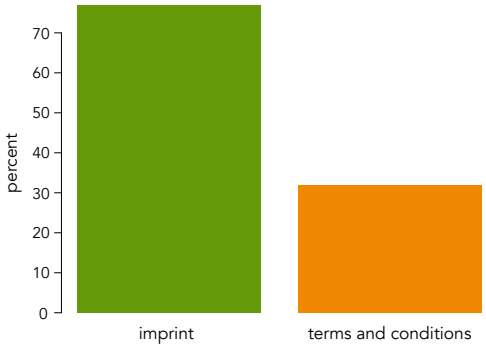
Figure 5.4 illustrates the usage of content management systems (CMS). Almost 50 % of wineries are using any kind of CMS for their websites. This is a good sign because when using a CMS, webshops can be included easily. If many wineries have their own webshop, the need for a communication interface in that area grows.



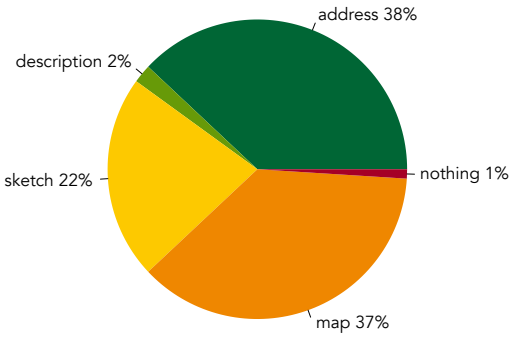
(a) General information on a website

(b) Product information

(c) Sales information



(d) Legal information



(e) Contact information type

Figure 5.5: Different types of information on winery websites

Figure 5.5 shows information available on winery websites. In figure 5.5a, results of the category *General Information* are shown. As you can see, nearly every winery offers information about themselves on their website. Between 60 and 80 % offer information about vineyards, the region and news. Information on the other topics is rather low, and as you will see in section *Correlations* there are really some interesting correlations between these topics and winery sizes.

Figures 5.5b and 5.5c show results of the category *Product & Sales Information*. A large number of wineries offer information on their wines but only half of them offer price information. One reason for this is (as we found out in our wine survey figure 3.36) price transparency due to wine merchants. About 45 % give us information on buying conditions and about 40 % have information on outlets where you can buy there wines. As you will see later this is also in correlation with the winery size.

The last two figures 5.5d and 5.5e show results of the category *Legal Info*. A big number of wineries has an imprint and about 30 % provide terms & conditions for their customers. Mostly only websites with a webshop or an order form offer terms & conditions. You can read more on that later. We would say all of the wineries give us some kind of contact information on their website. Only one site had absolutely no information but this was a really bad website and it was rather an outsider. Over 50 % give us some kind of map or sketch additionally to their contact info. A small part just describes how to find the address and more than a third only provide address information.

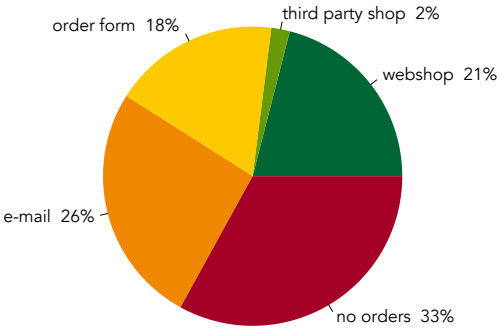
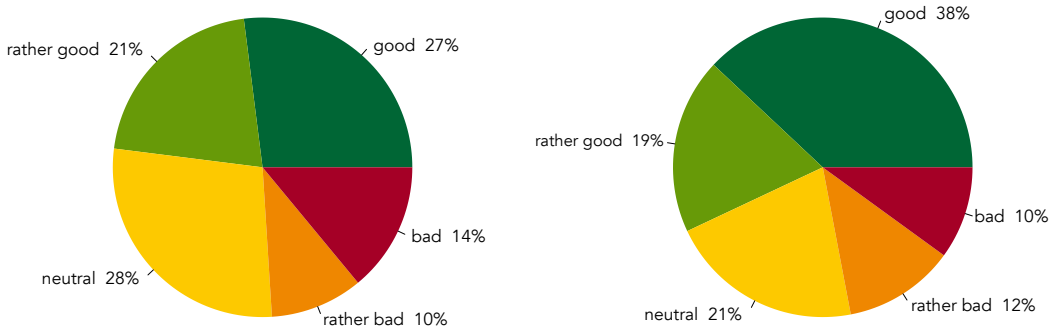


Figure 5.6: Order options

Figure 5.7 illustrates results of the category *Look & Feel*. Figure 5.7a shows our opinion on the designs and figure 5.7b shows the content results. We would rate these results as average because about 50 % of analyzed websites get rated high with *"good"* and *"rather good"*. About a quarter are rated as *"neutral"* and about a quarter as *"rather bad"* and *"bad"*. As you will see later in section *Correlations* there are also some interesting correlations between winery sizes and information.

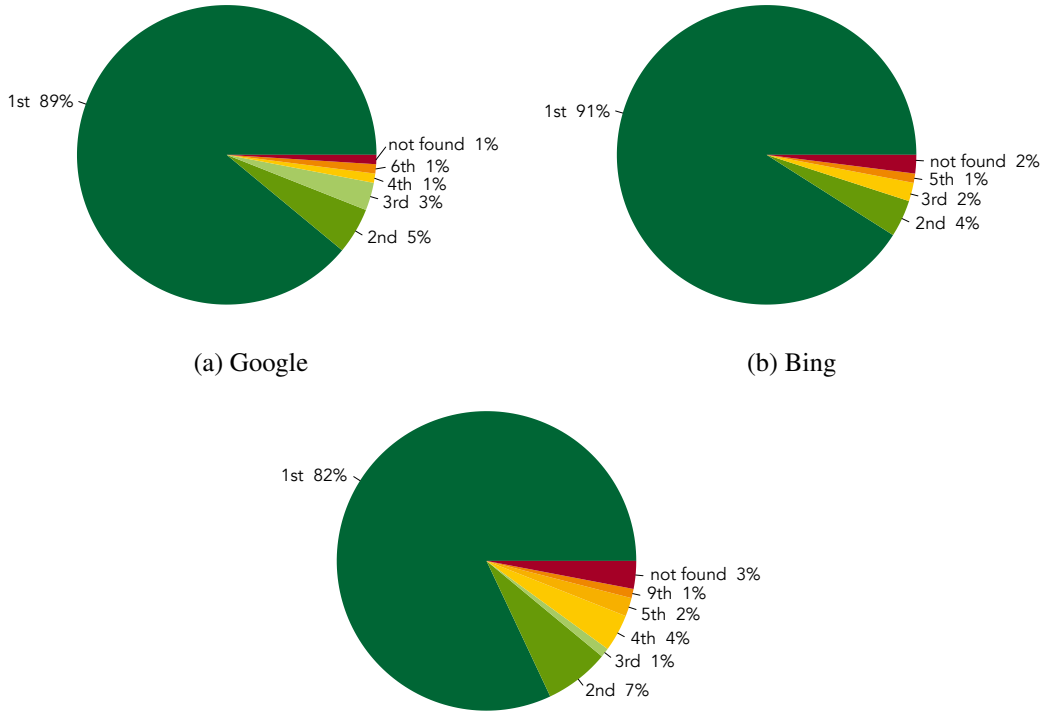
In figure 5.8 winery search ranks of *Google*, *Microsoft Bing* and *Yahoo!* are shown. We search for the winery names and in most of the cases the wineries get ranked first. If they only got ranked second or third, it was very likely that a social media page (e.g. Facebook) of the winery is ranked before the actual website. Worse ranked wineries are often small and medium sized.

Notice: *We did't analyze the search engine marketing of wineries. The search rankings just represent the result position after searching for the winery name.*



(a) Design (b) Content

Figure 5.7: Look and feel of the websites



(a) Google (b) Bing

(c) Yahoo

Figure 5.8: Search Engine Rankings

Excellent results could be explored in browser compatibility. The websites are evaluated in the four frequently used browsers *Google Chrome*, *Mozilla Firefox*, *Internet Explorer* and *Apple Safari*. Every website is working in every browser (browser versions during tests: IE 11, Chrome 36.0.1985.143, Firefox 29.0.1, Safari 7.0.6). Figure 5.9 illustrates the good results.

Figure 5.10 shows the automatic testing results of Nibbler (for details on Nibbler see page 58). As you see the scores are average. Accessibility and technology are rated higher rated the average and marketing is rather low. As we evaluate many websites, we have to say that it is very hard to get a high score on Nibbler because if only a few of the evaluated topics are not implemented or not rated very well, the score gets low. So we would say the results for the winery websites are quite reasonable.

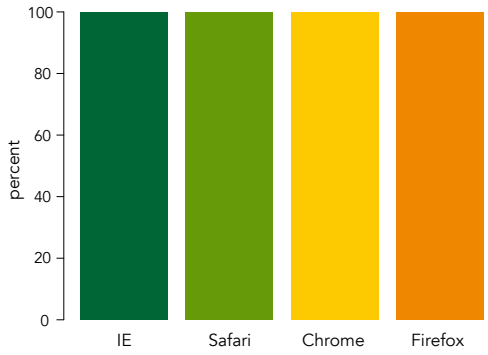


Figure 5.9: Browser support

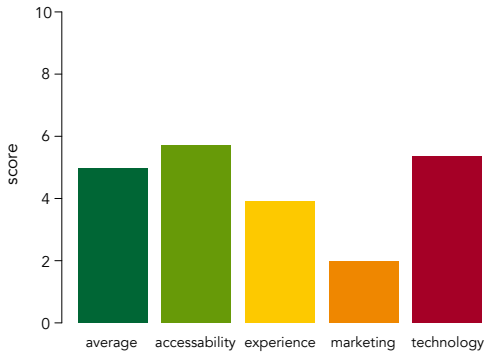


Figure 5.10: Average scores of Nibbler

Hypothesis H.C1 **approved**

Websites are e-commerce channel no. 1 for wineries.

The results of our wine survey and website evaluation prove that websites are the most important e-commerce channel for wineries. (E-) Marketing clearly shows that 94% of wineries have a website, but only a third of them also offer a webshop for their customers. Also social media usage is about 50%. The website evaluation shows similar results. Figure 5.5a illustrates that only 20% of wineries refers to a social media page or send out newsletters. Additionally only a third of Austrian wineries offer a proper webshop relating to figure 5.6.

Hypothesis H.C2 **uncertain**

Websites of wineries are out-dated.

We are afraid to say that we can't evidently prove or disprove this hypothesis. When looking at our website evaluation we can find both, websites with out-dated data and websites which are always up to date. In most of the cases small wineries tend to have out-dated data and big wineries tend to keep there websites up to date. We assume that big wineries have employees who are responsible for marketing and therefore have updated websites.

Correlations

Figure 5.11 shows a correlation matrix for the information, the winery size, quality of design and quality of content. Taking a deeper look on the matrix reveals interesting conclusions.

Beginning with the information section on the matrix, we can see that price information of products correlates with a webshop, ordering conditions and terms & conditions (A). Further press information has a high correlation with a download section because nearly every press page offers downloads with press material(C). It is also very likely that if a winery offer a webshop, it will also offer price information and terms and conditions (D, F). If there is information on the wine-growing region, it is likely that there exists information about the vineyards (B). Winery websites also tend to be more informative if they offer an imprint, a newsletter or some type of social media (K). In these cases it is more likely to get full information about winery, vineyards and so on.

Taking the winery sizes into account, it is very likely that rather bigger wineries offer more information. In wineries starting at size L, the tendency to information about outlets, press, downloads or newsletter is higher than in S and M sized wineries (G, O). Interestingly, size M wineries have a high tendency to have other information about an own restaurant or "Heurigen" included (E).

When comparing information and sizes with design and contents, it is rather likely to have a good design and good contents if the winery is a big one. For us, this means that bigger wineries have a higher budget for E-marketing and therefore have better websites. Wineries with press information and downloads also tend to have good design and contents (K). To the contrary websites with bad content do not offer information on news, press, downloads and so on (L). The correlation of good design and good contents is also very high (J, M, N). It will be probable that in these cases rather professionals design and code the websites just like good design relates to good contents (M), bad design relates to bad contents (N). In this case the correlation is as well very high. Between those cases the correlations are not that high, so these groups are mixed up a bit. Interestingly, bad contents do not correlate with a news page on the website (L). This means that contents don‘t get maintained and therefore are rather bad. Further the categories within winery sizes (H) and contents (I) do not corelate at all, which is an indicator for good data, because it shouldn't be possible that one website is rated in several categories.

As you can see many interesting correlations between the information the website is offering, design and contents and the winery sizes can be seen. More detailed correlation information can be looked up in figure 5.11.

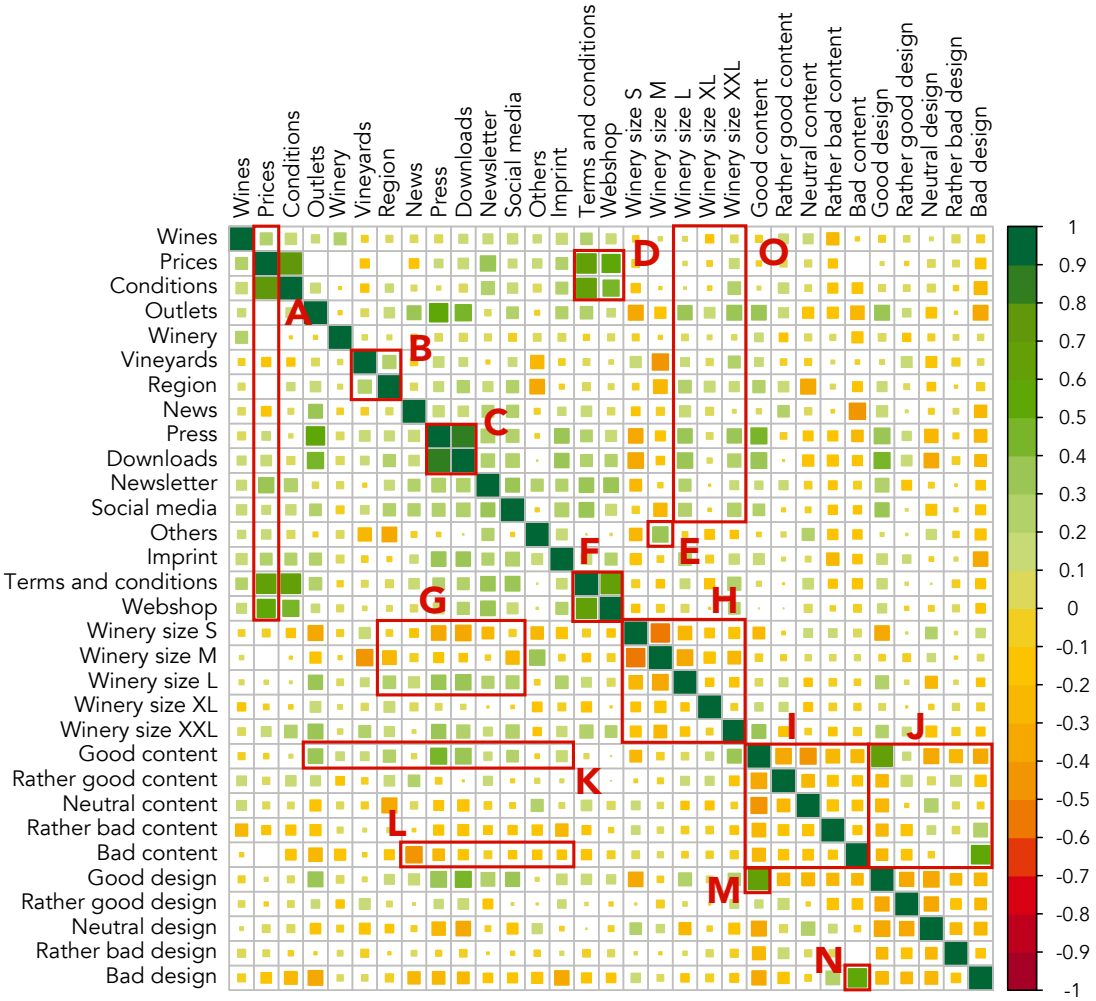


Figure 5.11: Correlations of web fitness analysis

Learnings

- Quality of contents and design of a website are related to the winery size. Bigger wineries have better websites.
- Good design of the websites is related to good contents.
- Winery websites with price information of their products also provide information on terms and conditions for purchasing wines.
- Big sized wineries offer more information than small sized wineries.
- Websites with information on vineyards also provide information on the wine-growing region.

5.4 Conclusion

Summarizing the results we can say, that a big part of the tested winery websites can be rated as good. The most important information about wineries, news, vineyards, wine-growing regions and wines is largely available. Therefore the potential customer can gather a basic knowledge about wineries (see fig. 5.5). In addition two thirds of the wineries have some kind of order process available for the customer, either by e-mail, order form or webshop. The latter is only included on 20% of the websites. In this area improvements could be made, because with a real webshop the wine-grower has the full pallet of e-commerce tools available.

It seems as if big wineries have already realized the benefits of webshops, newsletters, social media and others because these services correlate with rather big wineries. But maybe big wineries have invested more in these topics due to a higher budget and the smaller ones have to realize this and must steer their investments into e-commerce channels, too. We see a high potential in this field.

Apart from that we think that most wine-growers will be willing to invest more into e-commerce in the future. The start is to have a website and maybe in a few years from now most of them will have their own webshop. Therefore we see a big potential for our *Wine Data Exchange Interface* in this area.

For the WDX interface we could also detect some pattern in the information offered by the wineries. The information about the winery and the wines is structured similar on most of the webpages/webshops. This knowledge is the last missing part in our analysis of the Austrian wine market. In the next chapter our knowledge learning get consolidated by developing the XML interface for wine data exchange.

CHAPTER 6

Wine Data Exchange Interface

After analyzing the Austrian wine sector regarding their PC systems in use, some applications and the websites of some wineries in the previous chapters, we combine the gained knowledge for developing our communication interface. The data exchange interface is based on XML and is developed with the XML Schema Definition language. The interface is called *Wine Data Exchange Interface*. The full XSD for the Wine Data Exchange Interface (hereafter referred to as WDX Interface) can be found in appendix C.1.

In order to make sure that every way of data communication between various winery software is possible, we structure the WDX Interface for wineries modular so that many use cases can be covered. Every possible information about a winery is stored inside the winery element. It includes general winery information, contact information, social media, vineyards, wines, information about warehouses and administrative reports. The latter will be in development all the time, depending on governmental or law changes for the structure and content of the administrative reports. For now, two reports required by law in Austria are supported.

The next sections will discuss the interface in detail and provide important information for the usage of the WDX Interface.

6.1 Purpose and Use Case Examples

The WDX Interface should evolve as a standard for data communication in viticulture. The data conversions from a proprietary source system into the WDX format will always happen in the source system. After conversion the data get transferred to the target system where the data conversion into the proprietary target system data format will take place.

If many systems implement the WDX Interface, many ways of use will be possible. The following list shows a few use case scenarios for our interface. These are just a fractional part of all possible applications.

Communication between different Applications
The main for the development of this interface was to accomplish communication between different applications. A winegrower uses a cellar management application and a webshop, for example. With the WDX Interface the two of them can communicate and update information on actual stock, movements and so on.

Simple Data Exchange
Imagine that you don't like your old cellar management application any more and want a new one. Ex- and importing the old data isn't that easy most of the time. But if both applications support the WDX Interface, this will be a task of a few minutes depending on the amount of data.

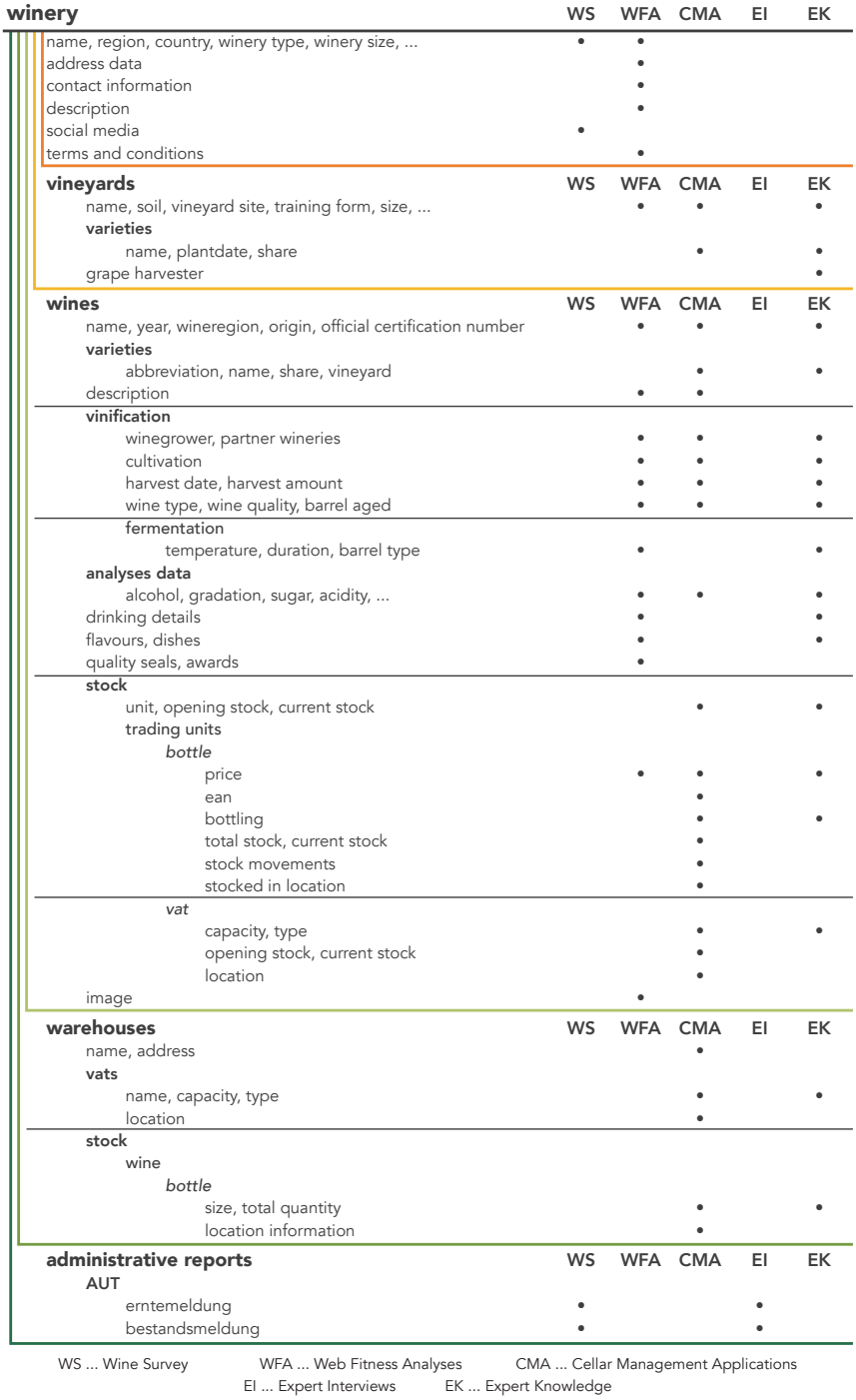
Usage in partner networks
There are many wine-grower associations nowadays. In most cases they sell wines under the same brand or produce a certain wine together. The WDX Interface could help to establish a partner network to make communication of wine data easier.

Automatic submission of administrative reports
Nowadays, if a winegrower uses a cellar management application, preparing claimed administrative reports is easy because the application does all the calculations. Yet, when it comes to delivering the reports one has to manually enter the data into an online form. With the WDX Interface this process could be done in one mouse click.

Provide Data Feeds
As you will see in our prototype in chapter 7, we can provide an XML feed based on the WDX Interface. This way, marketing platforms such as Unserwein.at or webshops will be able to access a wine feed and will always be up-to-date with their wine data.

Long time data archiving
Data archiving is a broad topic today. The big issue is how to store data without losing the capability of reading the data format. With a standardized XML Interface (like WDX) based just on plain text files, which are semi-structured and human readable, a big step could be taken in the wine industry.

6.2 Structure Overview



winery	WS	WFA	CMA	EI	EK
name, region, country, winery type, winery size, ...	•	•			
address data		•			
contact information		•			
description		•			
social media	•				
terms and conditions		•			
vineyards	**WS**	**WFA**	**CMA**	**EI**	**EK**
name, soil, vineyard site, training form, size, ...		•	•		•
varieties					
name, plantdate, share			•		•
grape harvester					•
wines	**WS**	**WFA**	**CMA**	**EI**	**EK**
name, year, wineregion, origin, official certification number		•	•		•
varieties					
abbreviation, name, share, vineyard			•		•
description		•	•		
vinification					
winegrower, partner wineries		•	•		•
cultivation		•	•		•
harvest date, harvest amount		•	•		•
wine type, wine quality, barrel aged		•	•		•
fermentation					
temperature, duration, barrel type		•			•
analyses data					
alcohol, gradation, sugar, acidity, ...		•	•		•
drinking details		•			•
flavours, dishes		•			•
quality seals, awards		•			
stock					
unit, opening stock, current stock			•		•
trading units					
bottle					
price		•	•		•
ean			•		
bottling			•		•
total stock, current stock			•		
stock movements			•		
stocked in location			•		
vat					
capacity, type			•		•
opening stock, current stock			•		
location			•		
image		•			
warehouses	**WS**	**WFA**	**CMA**	**EI**	**EK**
name, address			•		
vats					
name, capacity, type			•		•
location			•		
stock					
wine					
bottle					
size, total quantity			•		•
location information			•		
administrative reports	**WS**	**WFA**	**CMA**	**EI**	**EK**
AUT					
erntemeldung	•			•	
bestandsmeldung	•			•	

Figure 6.1: Overview on the Wine Data Exchange Interface

Figure 6.1 depicts an overview of the elements of the WDX Interface for wineries. The root element *winery* contains, besides general winery data as e.g. address and contact information, four main subelements which are *vineyards, wines, warehouses* and *administrative reports*. The names of the subelements are self-explaining and may contain unbound elements of their type e.g. *vineyards* may contain many *vineyard* elements. The *vineyard* element will store information on the vineyards of the winery. It contains the name, site, varieties or an indicator if it will be possible the use a grape harvester or not. *Wine* is the most complex subelement of the interface. Very detailed data about a wine can be stored inside it. Examples are: name, year, detailed variety information, detailed vinification information, analyses data, details on drinking age or temperature, current stock information and many more. The *wine* element covers all data which can be stored in CM apps or which will be available on websites. The *warehouse* element is reserved for information on different warehouses and cellars where wine get stocked. It contains information about the location, the vats and stock information. The last subelement is *administrative reports*. This element is modular and can contain subelements for every country. This country nodes can then contain country specific administrative data. For our first version just Austrian administrative reports get supported but in the future more and more countries may join.

The figure also shows how the results of the previous chapters have been consolidated to develop the XML based interface. On the right side five columns tell us in which analysis of the thesis we gathered the knowledge for the need of the element. As an example the knowledge to develop the stock element inside of wine was gathered in the cellar management application analysis.

6.3 XML based Communication Interface

Our communication interface called WineDataXchng Interface (WDX Interface) is fully based on winery objects. the root element is called wineries and can contain unbounded occurrences of winery elements. The element *winery* itself contains every possible information about a winery, like name, region, or address. It also contains the complex data types of contact persons, social media information, vineyards, wines, warehouses and administrative reports. Every single element of these can be part of the winery object or not.

Source code 6.1 depicts the general structure of the root element *wineries* with all the single *winery* objects. In this section every complex element of a winery is discussed in detail. All source code snippets you will see in further sub sections are part of a whole working example of the WDX Interface and can be looked up in appendix C.2. The whole XML Schema Definition can also be looked up in appendix C.1.

Notice: *All types of enumerations are based an best practice experience [5, 53] and can of course be enhanced in the future.*

```
<wineries>
  <winery>

    <!-- General winery information comes here. -->

    <address> <!--               Address Information         --> </address>
    <contact> <!--               Contact Information         --> </contact>
    <socialMedia> <!--           Social Media Information    --> </socialMedia>
    <vineyards> <!--             Vineyards Information       --> </vineyards>
    <wines> <!--                 Wines Information           --> </wines>
    <warehouses> <!--            Warehouses Information      --> </warehouses>
    <administrativeReports> <!-- Administrative Reports Info --> </administrativeReports>
  </winery>

  <winery> <!-- Another winery --> </winery>
  <winery> <!-- Another winery --> </winery>
</wineries>
```

Source code 6.1: General Structure of the WDX Interface

Winery Element

Source code 6.1 showed you the basic structure of the WDX Interface. Now the most important element, the winery element gets explained in detail. All explanations are based on the source code example 6.2.

The winery element starts with some general information about the winery which are *id, linkTo, name, shortcut, winery number, legal structure, tax id, vat id, address, contact persons, wine-growing region, wine-growing country, winery type, winery size, bottles per year, short description and a long description*. *Address*, *persons* and *description* elements can occur several times. The others just occur once or not at all. The element *linkTo* links to another winery id, if, e.g., two wineries are owned by the same wine-grower but have different agricultural and legal structures. The other elements for general information are rather straight-forward and self-explaining.

The next element, *social media*, contains links to wineries' social media platforms. For the most important platforms Twitter, Facebook, Goolge+, LinkedIn, Xing, Pinterest and Tumblr there are elements and for others you can add platforms with name and URL. In our example we named unserwein.at[1] among others. Wineries may use the *terms and conditions* element in combination with a webshop, for example.

The last elements of the winery object are *vineyards, wines, warehouses and administrative reports*. These elements are discussed in detail in the following subsections.

```
<winery id="wghhol">
  <linkTo>otherWineryID</linkTo>
  <name>Weingut Hugo Holunder</name>
  <shortcut>WGHHOL</shortcut>
  <wineryno>1234567</wineryno>
  <legalStructure>KG</legalStructure>
  <taxID>345 653423 234</taxID>
  <vatID>523 243553 134</vatID>

  <address>
    <country>AUT</country>
    <city>Feldstadt</city>
```

[1] http://www.unserwein.at

```
13      <zip>3452</zip>
14      <street>Baumstrasse</street>
15      <streetnumber>23</streetnumber>
16      <phone>+43 4562 60453</phone>
17      <fax>+43 4562 60453</fax>
18      <mobile>+43 664 3547723</mobile>
19      <email>weingut@hugoholunder.at</email>
20      <website>http://www.hugoholunder.at</website>
21    </address>
22
23    <contact>
24      <person>
25        <titlePrefix>Ing.</titlePrefix>
26        <firstName>Hugo</firstName>
27        <lastName>Holunder</lastName>
28        <titleSuffix>BSc.</titleSuffix>
29        <country>AUT</country>
30        <sex>male</sex>
31        <phone>+43 4562 60453</phone>
32        <mobile>+43 664 3547723</mobile>
33        <email>hugo@hugoholunder.at</email>
34      </person>
35      <person> <!-- another person --> </person>
36    </contact>
37
38    <wineregion>Neusiedlersee</wineregion>
39    <country>AUT</country>
40    <wineryType>biodynamic</wineryType>
41    <winerySize unit="ha">8</winerySize>
42    <bottlesPerYear>50000</bottlesPerYear>
43
44    <shortDesc lang="DE"> Eine kurze Beschreibung </shortDesc>
45    <shortDesc lang="EN"> A short description </shortDesc>
46    <description lang="EN"> A long description </description>
47
48    <socialMedia>
49      <facebook>www.facebook.com/weinguthugoholunder</facebook>
50      <twitter>www.twitter.com/weinguthugoholunder</twitter>
51      <others>
52        <platform>
53          <name>Unser Wein</name>
54          <url>www.unserwein.at/weinguthugoholunder</url>
55        </platform>
56      </others>
57    </socialMedia>
58
59    <termsAndConditions> Some Terms and Conditions </termsAndConditions>
60
61    <vineyards> ............... </vineyards>
62    <wines> ................... </wines>
63    <warehouses> .............. </warehouses>
64    <administrativeReports> ... </administrativeReports>
65  </winery>
```

Source code 6.2: Structure of a winery.

Vineyards Element

As its name implies the vineyards element stores information on the vineyards of a winery. An element *vineyards* contains many *vineyard* elements. Every vineyard must have a name. The other elements *soil, vineyard site, training form, size, production, varieties, grape harvester and notes* are not compulsory. Soil and training form are enumerations which you can look up in the schema definition (see appendix C.1). *Varieties* contains single *variety* elements with a mandatory *name* and optional *planting date and share* elements. *Share* defines the share of the variety of the vineyard. Source code 6.3 shows an example for defining vineyards.

```xml
<vineyards>
  <vineyard id="vineyard01">
    <name>Rosenberg</name>
    <soil>sand</soil>
    <vineyardSite>hillside</vineyardSite>
    <trainingForm>high</trainingForm>
    <size unit="are">80</size>
    <production unit="hl">80</production>
    <varieties>
      <variety>
        <name>Chardonnay</name>
        <plantdate>1990-01-01</plantdate>
        <share unit="percentage">50</share>
      </variety>
      <variety>
        <name>Welschriesling</name>
        <plantdate>1992-01-01</plantdate>
        <share unit="percentage">50</share>
      </variety>
    </varieties>

    <grapeHarvesterPossible>true</grapeHarvesterPossible>
    <notes>
      1992 wurde der Nachbargrund gekauft und
      Welschriesling ausgesetzt.
    </notes>
  </vineyard>

  <vineyard> <!-- another vineyard --> </vineyard>
  <vineyard> <!-- another vineyard --> </vineyard>

</vineyards>
```

Source code 6.3: Structure of vineyards.

Wines Element

The most important thing a winery has are, of course, its wines. In this subsection the *wines* element is described. The *wines* node may contain many *wine* elements. Wine itself is the biggest subelement of a winery. Wine is a rather complex structure because of plenty of information which has to be stored. Source code example 6.4 depicts the *wines element*.

First of all a wine has to have a name. All the other information is optional. *Year, wine region, origin and official certification number* are self-explaining. Furthermore a wine may consist of several *varieties*. Therefore the varieties element contains several *variety* elements. Every variety can have an *abbreviation, a name, the percentage* share and a link to its *vineyard* element. Every wine can have several *short* and *long description* elements in various languages. The *vinification* element contains vinification details like the *wine-grower, partner wineries, quality or the fermentation process*. Most elements inside of vinification are self-explaining. The element *partner wineries* is needed if two ore more wine-growers cooperate when producing the wine. *Wine type* in vinification and *unit* in *barrel aged* are enumerations which can be looked up in the schema definition (see appendix C.1).

The next big subelement of wine is *analyses data*. As the name implies inside this element analyses data such as *alcohol, sugar, acidity, gradation, sulphur, malic acid* and more is stored. As there are several methods to determine the gradation, the element is a complex type and contains *type* and *value*. Type examples are "Klosterneuburger Mostwaage (KMW)" or "Oechsle". The other elements have the attribute *unit* where the user can define the data unit e.g. g/l. The element names are self-explaining regarding their contents.

The element *drinking details* stores information on *drinking temperature and aging ability*. In *flavours* the different wine flavours are stored. *Dishes* is very similar to *flavours*, but contains food recommendations for the wine. The *quality seal* element will be necessary if the wine follows the rules of some quality seals. An example for a Austrian wine quality seal is the *"Districtus Austriae Controllatus" (DAC)*. A comparable quality seal in Italy would be the *"Denominazione di origine controllata" (DOC)*.

A wine may also win some *awards*. Therefore the awards node can contain several *award elements*. As every award has different rules and guidelines to follow, we build our award element as you can see in source code 6.4 on line 95. We introduced the elements *score type*, *min* and *max score* and the actual score. Of course an award also has a name, a description and gets published somewhere. The given example should be self-explaining.

A more complicated and very large element of a wine is the *stock* element. First off all it contains elements to store the overall *opening stock* and the *current stock*. The *unit* of opening- and current stock also has to be known. Afterwards the different *trading units* can be stored. The same wine could be traded in different types of bottles or for big wine merchants in vats. Therefore, a list of bottles and then a list of vats can be stored in trading units. *Vat* is more easy to explain. A *vat* has a capacity, a type (e.g. steel, oak or wood), an opening- and current stock and a specific location in a warehouse (a cellar is also a warehouse in the WDX Format). Bottle is a more complex data type. A *bottle* has a *size*, a specific *bootle top*, can be *available* from a specific date on and can have different *prices* for different customer groups. It also can have an *EAN number* and can be *bottled* in several *charges* on different dates. Of course there is a *total stock* of all bottles which is the sum of all bottling charges and a *current stock* which

is the amount of bottles currently available. If one uses the WDX Interface for communication between different shops, the *stock movements* element is interesting. This element can contain many *stock movement* elements which are responsible for storing how many bottles were sold at what price on which date. The last element in *bottle* is the *stocked in* element. In this element the different locations of the bottles in a warehouse can be stored.

And last but not least one can store image information of several images. The image element either contains just an URL to an image on the web or can be embedded as *base 64 binary object*.

```
<wines>
  <wine id="wine01">
    <name>Chardonnay</name>
    <year>2013</year>
    <wineregion>Neusiedlersee</wineregion>
    <origin>WLBL</origin>
    <officialCertificationNumber>E 1923/14</officialCertificationNumber>

    <varieties>
      <variety>
        <abbr>CH</abbr>
        <name>Chardonnay</name>
        <percentage>30</percentage>
        <vineyard id="vineyard01">Rosenberg</vineyard>
      </variety>
    </varieties>

    <shortDesc lang="DE">Guter Wein.</shortDesc>
    <shortDesc lang="EN">Great wine.</shortDesc>
    <description lang="EN">Amazingly great wine.</description>

    <vinification>
      <winegrower>Hugo Holunder</winegrower>

      <partnerWineries> <!-- One can define partner wineries --> </partnerWineries>

      <cultivation>konventionell</cultivation>
      <harvestDate>2013-09-10</harvestDate>
      <harvestAmount unit="kg">7000</harvestAmount>
      <wineType>white</wineType>
      <wineQuality>Qualitaetswein</wineQuality>
      <barrelaged>
        <count>4</count>
        <unit>months</unit>
        <type>steel</type>
      </barrelaged>

      <!-- <maturation>  </maturation> -->

      <fermentation>
        <temperature unit="celsius">17.5</temperature>
        <duration unit="days">10</duration>
        <barreltype>steel</barreltype>
        <notes>low temperature fermentation process</notes>
      </fermentation>
      <notes>Some notes.</notes>
    </vinification>

    <analysesData>
      <alcohol unit="Vol%">12.5</alcohol>
      <gradation>
        <type>KMW</type>
        <value>18</value>
      </gradation>
      <sugar unit="g/l">4</sugar>
      <sugarfreeExtract unit="g/l">4</sugarfreeExtract>
      <acidity unit="g/l">6</acidity>
      <titratableAcidity unit="g/l">0</titratableAcidity>
      <volatileAcidity unit="g/l">0</volatileAcidity>
      <sulphur unit="mg/l">45</sulphur>
```

```
      <totalSulphur unit="mg/l">95</totalSulphur>
      <!-- <specificGravity unit=""></specificGravity> -->
      <totalPhosphor unit="g/l">0</totalPhosphor>
      <gluconicAcid unit="g/l">0</gluconicAcid>
      <malicAcid unit="g/l">0</malicAcid>

      <notes>these are good results</notes>
    </analysesData>

    <drinkingDetails>
      <temperature unit="celsius">
        <from>12</from>
        <to>15</to>
      </temperature>
      <agingAbility>
        <from>2014</from>
        <to>2015</to>
      </agingAbility>
    </drinkingDetails>

    <flavours>
      <flavour>Banana</flavour>
      <flavour>Apple</flavour>
      <flavour>Pear</flavour>
    </flavours>

    <dishes>
      <dish>Fish</dish>
      <dish>Steak</dish>
    </dishes>

    <qualitySeal>Kremstal DAC</qualitySeal>

    <awards>
      <award>
        <name>AWC Vienna</name>
        <description></description>
        <scoreType>Points</scoreType>
        <minScore>0</minScore>
        <maxScore>100</maxScore>
        <score>88</score>
        <prize>AWC Silver</prize>
        <additionalInformation>Best Buy 2014</additionalInformation>
        <awardDate>2014-06-06</awardDate>
        <publisher>Hubert Huber</publisher>
        <publishedIn>AWC Vienna Journal 07/2014</publishedIn>
      </award>
    </awards>

    <stock>
      <unit>1</unit>
      <openingStock>5000</openingStock>
      <currentStock>2375</currentStock>

      <tradingUnits>
        <bottle>
          <size unit="ml">750</size>
          <bottleTop>Screwcap</bottleTop>
          <availableOn>2014-02-15</availableOn>
          <soldOut>false</soldOut>
          <price>
            <value>5.90</value>
            <currency>EUR</currency>
            <list>Standard</list>
            <gross>true</gross>
            <VAT>20.0</VAT>
          </price>
          <ean>
            <number>1234567890123</number>
            <type>EAN-13</type>
          </ean>
          <bottling>
            <charge id="chardch75001">
```

```
134                 <bottlingDate>2014-02-10</bottlingDate>
135                 <bottlesFilled>1500</bottlesFilled>
136               </charge>
137               <charge id="chardch75002"><!-- further charges--></charge>
138             </bottling>
139             <totalStock>3000</totalStock>
140             <currentStock>1500</currentStock>
141
142             <stockMovements>
143               <stockMovement>
144                 <date>2014-03-06</date>
145                 <quantity>6</quantity>
146                 <unitprice>
147                   <value>5.90</value>
148                   <currency>EUR</currency>
149                   <list>Standard</list>
150                   <gross>true</gross>
151                   <VAT>20.0</VAT>
152                 </unitprice>
153                 <notes>Notizen</notes>
154               </stockMovement>
155             </stockMovements>
156
157             <stockedIn>
158               <location>
159                 <id>wh01</id>
160                 <name>Warehouse 1</name>
161                 <lane>3</lane>
162                 <column>2</column>
163                 <row>1</row>
164                 <bin>301</bin>
165                 <containertype>carton</containertype>
166                 <quantity>700</quantity>
167               </location>
168               <location><!-- further location ... --></location>
169             </stockedIn>
170           </bottle>
171           <vat id="vat01">
172             <capacity unit="l">5000</capacity>
173             <type>steel</type>
174             <openingStock>5000</openingStock>
175             <currentStock>2375</currentStock>
176             <location>
177               <id>wh01</id>
178               <name>Warehouse 1</name>
179               <lane>1</lane>
180               <column>2</column>
181               <row>1</row>
182             </location>
183           </vat>
184         </tradingUnits>
185       </stock>
186
187       <image>
188         <url>http://www.hugoholunder.at/wines/white/chardonnay13.jpg</url>
189         <!--
190           With <embedded> you can also embed a base64 binary image
191         -->
192       </image>
193
194       <notes> Wine Notes </notes>
195     </wine>
196   </wines>
```

Source code 6.4: Structure of wines.

Warehouses Element

Wines must be stored somewhere. For that reason most wineries have one or more warehouses. In most cases the warehouse is the cellar, but due to simplicity in the WDX Format everything is named warehouse. The *warehouse element* can be found inside the *warehouses node*. *Warehouses* can contain several *warehouse elements*. A warehouse has a name, an address and may have an optional *id* attribute. Inside the warehouse can be various vats. Therefore the *vats node* contains several *vat elements*. Every vat has a *capacity* and can have an optional *id, name, type* and *location*. *Location* contains information on the exact position of the vat.

The *stock node* contains the wine stock of the warehouse. The stock is composed of many *wine elements*. The *id* links to the corresponding wine in the wines node. For every wine different types of *bottles* with *size, total quantity* and several *location elements* are supported. In *location* the exact position of the wine in the warehouse can be stored.

Source code 6.5 shows an example of the warehouses node with a declared warehouse.

```
<warehouses>
  <warehouse id="wh01">
    <name>Warehouse 1</name>
    <address> <!-- address details. see winery example --> </address>

    <vats>
      <vat id="vat01">
        <name>Vat5000</name>
        <capacity unit="l">5000</capacity>
        <type>steel</type>
        <location>
          <lane>1</lane>
          <column>2</column>
          <row>1</row>
        </location>
      </vat>
      <vat> <!-- another vat --> </vat>
    </vats>

    <stock>
      <wine>
        <id>wine01</id>
        <bottle>
          <size unit="ml">750</size>
          <totalQuantity>700</totalQuantity>
          <location>
            <lane>2</lane>
            <column>3</column>
            <row>1</row>
            <bin>450</bin>
            <containertype>carton</containertype>
            <quantity>400</quantity>
          </location>
          <location> <!-- another location--> </location>
        </bottle>
        <bottle> <!-- another bottle --> </bottle>
      </wine>
    </stock>
  </warehouse>

  <warehouse> <!-- another warehouse --> </warehouse>
  <warehouse> <!-- another warehouse --> </warehouse>

</warehouses>
```

Source code 6.5: Structure of warehouses.

Administrative Reports Element

The *administrative reports node* is very important for the WDX Interface. Wineries have to deliver some required reports to the government and this node is responsible for that task. Due to the fact that in most cases administrative reports contain very sensible data, the element got outsourced into an independent element. Therefore it is possible to transfer government data with the WDX Interface containing only general information about the winery and the administrative report. Nothing else is necessary for a valid XML communication.

The element itself is structured according to countries. Every country can be seen as a module. In our example in source code 6.6 we listed Austria, Germany, Switzerland, France and Italy only to explain the modular design of the administrative reports element. So far only Austria (AUT element) is supported with two reports. In the future other countries and reports will also be supported. The supported reports for Austria are the two mandatory reports "Erntemeldung" and "Bestandsmeldung". Both are required by law and have to be done up to a specific date every year. Source code examples 6.7 and 6.8 show the structure of the reports.

```
<administrativeReports>
  <AUT>
    <erntemeldung> <!--    See example below --> </erntemeldung>
    <bestandsmeldung> <!-- See example below --> </bestandsmeldung>
  </AUT>

  <GER> <!-- XML Syntax for reports in Germany could be added here.     --> </GER>
  <CHE> <!-- XML Syntax for reports in Switzerland could be added here. --> </CHE>
  <FRA> <!-- XML Syntax for reports in France could be added here.      --> </FRA>
  <ITA> <!-- XML Syntax for reports in Italy could be added here.       --> </ITA>
</administrativeReports>
```

Source code 6.6: Structure for Administrative Reports

If we take a closer look at the structure of "Ernte-" and "Bestandsmeldung" in the following examples, we can see that the XML elements are named in German. The reason for this is that it would make no sense to translate the country specific terms to English because those reports are only needed in Austria. The elements of the two reports are just an exact representation of the form fields of the paper form. One important thing to mention is the *XOR-Comment*. It is possible to send a "Leermeldung" and if this is the case, the other element may not be part of the report. The XOR is also defined in the schema definition.

All the other elements follow the rules and standards of the actual paper or electronic forms to deliver the reports.

```
<erntemeldung>
  <stichtag>2014-11-31<stichtag>

  <leermeldung />
  <!-- XOR -->
  <ernte>
    <traubensorte>
      <name>BF</name>
      <qualitaet>QUW</qualitaet>
      <eingefuellterWein>liters</eingefuellterWein>
      <verkaufteTrauben>liters</verkaufteTrauben>
    </traubensorte>
    <traubensorte>
      <name>ME</name>
      <name>ZW</name>
      <name>BB</name>
```

```
      <qualitaet>QUW</qualitaet>
      <eingefuellterWein>liters</eingefuellterWein>
      <verkaufteTrauben>liters</verkaufteTrauben>
    </traubensorte>
  </ernte>
  <flaeche>
    <wertigerWein>
      <ha>2.53</ha>
    </wertigerWein>
    <wein>
      <ha>0</ha>
      <weiss>liters</weiss>
      <rotRose>liters</rotRose>
    </wein>
    <sonstigeErzeugnisse>
      <ha>0.23</ha>
      <weiss>liters</weiss>
      <rotRose>liters</rotRose>
    </sonstigeErzeugnisse>
  </flaeche>
  <beabsichtigteSuessung></beabsichtigteSuessung>
  <beabsichtigteEntsaeuerung></beabsichtigteEntsaeuerung>
  <abgabedatum>2014-11-28</abgabedatum>
</erntemeldung>
```

Source code 6.7: Structure of Austrian Administrative Report “Erntemeldung”.

```
<bestandsmeldung>
  <stichtag>2014-07-31</stichtag>

  <leermeldung /> <!-- Only if there is no bestand-Element-->
  <!-- XOR -->
  <bestand>
    <zugang>
      <ernte_fasszukauf>
        <wein>
          <weiss>liters</weiss>
          <rotRose>liters</rotRose>
        </wein>
        <!-- Every element contains <weiss> and <rotRose> -->
        <weinMitSorte>        <!-- ... --> </weinMitSorte>
        <landwein>            <!-- ... --> </landwein>
        <qualitaetswein>      <!-- ... --> </qualitaetswein>
        <praedikatswein>      <!-- ... --> </praedikatswein>
        <schaumwein_sonstige> <!-- ... --> </schaumwein_sonstige>
        <erzeugnisseEU>       <!-- ... --> </erzeugnisseEU>
        <EUverschnitt>        <!-- ... --> </EUverschnitt>
        <weinDrittlaender>    <!-- ... --> </weinDrittlaender>
      </ernte_fasszukauf>
      <flaschenzukauf>
        <!-- Contains the same subelements as ernte_fasszukauf -->
      </flaschenzukauf>
      <abgewerteterWein>
        <!-- Contains the same subelements as ernte_fasszukauf -->
      </abgewerteterWein>
    </zugang>
    <abgang>
      <fassverkauf>
        <!-- Contains the same subelements as ernte_fasszukauf -->
      </fassverkauf>
      <flaschenverkauf>
        <!-- Contains the same subelements as ernte_fasszukauf -->
      </flaschenverkauf>
      <abgewerteterWein>
        <!-- Contains the same subelements as ernte_fasszukauf -->
      </abgewerteterWein>
      <eigenverbrauch_schwund>
        <!-- Contains the same subelements as ernte_fasszukauf -->
      </eigenverbrauch_schwund>
    </abgang>
    <traubenmost>
```

```
45          <konzentrierterTraubenmost>
46            <weiss></weiss>
47            <rotRose></rotRose>
48          </konzentrierterTraubenmost>
49          <rektifizierterKonzTraubenmost>
50            <weiss></weiss>
51            <rotRose></rotRose>
52          </rektifizierterKonzTraubenmost>
53        </traubenmost>
54        <beabsichtigteAnreicherung> <!-- Yes/No --> </beabsichtigteAnreicherung>
55      </bestand>
56      <abgabedatum>2014-07-30</abgabedatum>
57    </bestandsmeldung>
```

Source code 6.8: Structure of Austrian Administrative Report “Bestandsmeldung”.

6.4 Conclusion

Hypothesis H.D1	**approved**
It is possible to design a generally applicable communication interface for wineries.	
With the development of our generally applicable wine data exchange interface we clearly proved this hypothesis.	

The XML based communication interface for winery data is generally applicable in all areas of wineries. Its structure allows the user to separate information in various subelements, such as vineyards, wines, warehouses and administrative reports. Every subelement then contains detailed information. The subelements do not have to exist along each other so if e.g. one wants to use the interface only for exchanging wine data, only the *wines* element is necessary. With the modular structured element *administrative reports*, governmental processes for various countries could be supported by the wine data exchange interface. In the first version only Austrian administrative reports are supported but in future versions other countries will join.

For our prototype, the theoretical developed XML interface get implemented in a working program to prove that the interface will work under real conditions. The prototype converts data into our WDX XML structure and from the WDX structure to a proprietary format without loosing information.

CHAPTER 7

Prototype

The last part of the thesis is to build a prototype to showcase the way the WDX Interface works. We build a very simple prototype for this purpose. Figure 7.1 shows the basic functionality of our program. In a first step we export some wine data of a cellar management application (see chapter 4), in our case we get a CSV-File from the Mauß Kellermanagement application. In the second step we convert the data to our WDX Format. For this purpose we generate a Java Library to make data conversions (see section 7.2 or [41, 48]). Afterwards we import the XML data into the online platform Avino.at[1] and convert the data into their proprietary data format.

With this prototype we want to proof, that our concept for a Wine Data Exchange Interface works and can be used with different datatypes for wines and wineries.

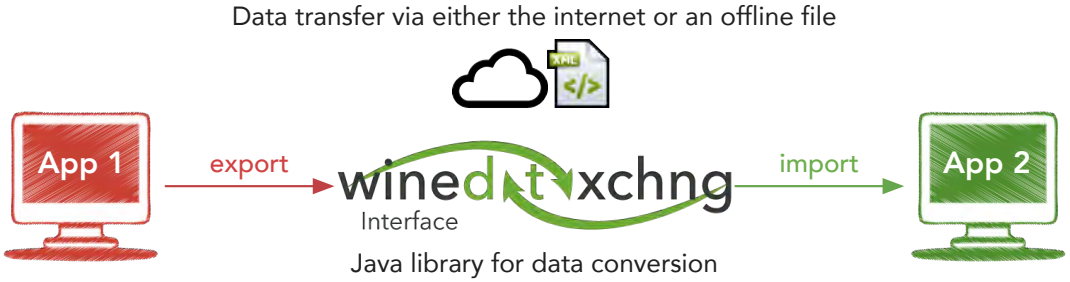


Figure 7.1: Functional principle of the prototype.

[1] Avino is an online platform for wineries where they can sell their wines. http://www.avino.at

7.1 Architecture Overview

For the prototype we develop a java library for data conversions from and to the WDX format. Technologies and functionality of the prototype, which are described in the next sections, are based on the following interface architecture depicted in figure 7.2. The Java library we develop is able to transform data from the WDX format to Java objects, which then can be used to create the proprietary data format of an application. For this purpose every application which wants to support the WDX format needs to include our data conversion library. In this way the application will be able to import and export data in the WDX format.

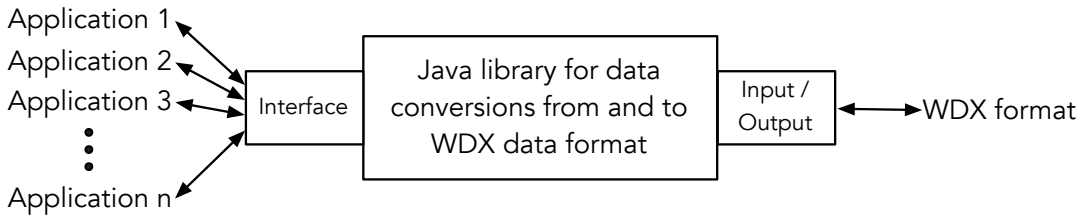


Figure 7.2: Architecture overview of the WDX library.

7.2 Technologies

The whole prototype is written in Java 1.6 [40]. Due to the fact that the prototype is written for Avino, which is an online platform, we use the Apache Wicket Framework [6, 56] for our user interface. The Java Library for data conversion is based on the *Java Architecture for XML Binding* [48]. The subsequent sections will explain the prototype in detail.

Apache Wicket

Apache Wicket [6, 56] is a component oriented framework for web development. Component oriented frameworks build a model of a requested page on the server side and send back HTML which is generated according to this model. In that kind of frameworks, the web pages and their HTML components are pure class instances. Because of that, Apache Wicket offers a real object-oriented abstraction of websites.

A simple Wicket web application only contains an application Java class, a class for a web page and an HTML file for the web page with the same name as the web page class.

Source code 7.1 to 7.3 will show you a simple Wicket web-application example. For more information on Apache Wicket please visit `http://wicket.apache.org`.

```
1  /* WicketApplication.java */
2  public class WicketApplication extends WebApplication {
3
4      @Override
5      public Class<? extends WebPage> getHomePage() {
6          return HomePage.class;
7      }
```

```
8
9       @Override
10      public void init() {
11          super.init();
12          // custom configurations here
13      }
14  }
```

Source code 7.1: Application class for simple Wicket web-application

```
1  /* HomePage.java */
2  public class HomePage extends WebPage {
3      public HomePage() {
4          add(new Label("helloMessage", "Hello World!"));
5      }
6  }
```

Source code 7.2: Web page class for Wicket web-app

```
1  <!-- HomePage.html -->
2  <html>
3    <head>
4      <title>Apache Wicket Hello World</title>
5      </head>
6    <body>
7      <div wicket:id="helloMessage"><!-- Labels message goes here --></div>
8    </body>
9  </html>
```

Source code 7.3: HTML file for Wicket web-page class

Java Architecture for XML Binding

Java Architecture for XML Binding (JAXB) [41,48] allows Java developers to map Java classes into XML representations. JAXB provides features for converting Java objects to XML and vice versa. These processes are called marshalling and unmarshalling and are described bellow. Because of JAXB, developers don't need to write XML loading and saving routines. It all gets done with the help of JAXB classes. JAXB is useful when XML specifications are complex and changing very often. After some XSD changes, the classes don't need to be written again but can just be generated by the use of XJC.

XJC is the binding compiler for JAXB. With XJC we can convert and bind all our XML elements from the XML schema definition to automatically create Java classes. Because of simplicity reasons we use XJC manually to create the Java Library for our prototype but JAXB classes can also be created on the fly during deploying processes in Java projects. The subsequent code snippet shows the XJC command in an Unix Terminal.

```
# The XJC command for mapping the XML Schema into Java classes
xjc -p com.winedataxchng.xmlschema -b wdx_bindings.xjb -npa -extension winedataxchng.xsd
```

We used the following options for code generation:

- p: specifies the target package of the generated Java classes
- b: specifies an external binding file

- npa: suppresses generation of package level annotations

- extension: allow vendor extensions - do not strictly follow the compatibility rules and app E.2 from the JAXB Specification

In the external binding file mentioned before, we define prefixes for the generated class names in order to prevent name conflicts with possible existing data structures in other applications. Furthermore we wanted to implement the Java class Serializable in every class of ours. Source code 7.4 shows our external binding file.

```
<jxb:bindings version="1.0"
    xmlns:jxb="http://java.sun.com/xml/ns/jaxb"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:xjc="http://java.sun.com/xml/ns/jaxb/xjc"
    jxb:extensionBindingPrefixes="xjc">

    <jxb:bindings schemaLocation="winedataxchng.xsd" node="/xsd:schema">
        <jxb:globalBindings>
            <xjc:serializable uid="1337" />
        </jxb:globalBindings>
        <jxb:schemaBindings>
            <jxb:package name="com.winedataxchng.xmlschema"/>
            <jxb:nameXmlTransform>
                <jxb:typeName prefix="WDX"/>
                <jxb:anonymousTypeName prefix="WDX"/>
                <jxb:elementName prefix="WDX"/>
            </jxb:nameXmlTransform>
        </jxb:schemaBindings>
    </jxb:bindings>
</jxb:bindings>
```

Source code 7.4: JAXB binding file for Wine Data Exchange XML Schema.

After generating our classes with the help of the XJC tool in combination with an external binding file, the library can be already used. Source codes 7.5 to 7.7 show examples how the library can be used.

The first example in source code 7.5 depicts how Java objects can be created with the help of the JAXB ObjectFactory. The ObjectFactory contains all methods to generate the Java class instances for XML Elements. In our example we first instantiate an ObjectFactory and afterwards create the root object WDXWineries. Then we create a single winery and add an id, a name and an address.

```
// ObjectFactory creates Java Objects for every XML Element
ObjectFactory factory = new ObjectFactory();

// Creating a winery with an address
WDXWineries wineries = factory.createWDXWineries();

WDXWinery w = factory.createWDXWineriesWDXWinery();
w.setId(id);
w.setName(name);

WDXAddress a = factory.createWDXAddress();
a.setZip(zip);
a.setCity(street);
a.setStreet(street);
a.setStreetnumber(streetnumber);
a.getPhone().add(phone);
a.getFax().add(fax);
a.getEmail().add(email);
a.getWebsite().add(website);
```

```
20
21  w.getAddress().add(a);
22
23  wineries.getWinery().add(w);
```

Source code 7.5: Sample code for creating an XML Java Object with the JAXB ObjectFactory

In our next example (source code 7.6) we create an XML file with the generated winery. For this purpose we have to create a Marshaller which is responsible for creating the XML structure. The process of converting Java objects to XML is called *marshalling*. For this reason the method to convert the object into XML and output it in some way (in our case to a file) is called *marshal*.

```
1  // Export as XML
2  try {
3      JAXBContext jc = JAXBContext.newInstance("com.winedataxchng.xmlschema");
4      Marshaller m = jc.createMarshaller();
5
6      m.setProperty( Marshaller.JAXB_FORMATTED_OUTPUT, Boolean.TRUE );
7      m.marshal(wineries, new File("path/to/file.xml"));
8  } catch (Exception e) { /* Error handling */ }
```

Source code 7.6: Sample code for generating an XML File by exporting the Java object

The last example shows the unmarshalling process. As marshalling is responsible for creating XML, unmarshalling works the other way around. During the process of unmarshalling an XML object gets converted into a Java object. An example how this can be done is shown in source code 7.7. Here a WDXWineries object is created by unmarshalling a *winedataxchng.xml* file.

```
1  // Import from XML
2  try {
3      JAXBContext jc = JAXBContext.newInstance("com.winedataxchng.xmlschema");
4      Unmarshaller u = jc.createUnmarshaller();
5
6      WDXWineries wineries = (WDXWineries) u.unmarshal(new File("path/to/winedataxchng.xml"));
7
8      /* Some work with WDXWineries */
9
10 } catch (Exception e) { /* Error handling */ }
```

Source code 7.7: Sample code for generating a JAXB object by importing some XML

7.3 Functionality

As mentioned in the introduction of this chapter, we keep our prototype very simple. The main purpose is to show that our interface will not just theoretically but also practically be compatible with different data types of existing applications.

Figures 7.3 to 7.6 show actual screenshots of the prototype. The user interface is integrated into the Avino platform. The functions of the prototype are:

1. Importing wines from cellar management applications

    a) Choose the application and file you are importing wines from and upload the information (Figure 7.3).

b) Select the wines you would like to import into your Avino products list (Figure 7.4).

2. Exporting wines in the WineDataXchng XML (WDX XML)

   a) Select wines you would like to export for other purposes (figure 7.5)

   b) Choose whether you like to export XML as file or feed (figure 7.6)

Due to the fact that cellar management applications do not support the WDX XML so far, we have to insert step 1.a into our prototype. In this step we map the proprietary wine data format of the cellar management application to our WDX XML. So we mock the process of getting the data in WDX XML from the beginning. Afterwards we map the WDX XML objects to the Avino data models in step 1.b.

The export method is straight-forward as you would expect it. The user can select the wines he would like to export in step 2.a. Then he/she can choose whether to export the data as a file or a feed (step 2.b). If he/she wants to export the wines as feed, he/she can chose a link (figure 7.5). This link is stored and can be reached permanently. If some data of wines exported to a feed changes, the feed is updated automatically. Exporting data as a feed can also be interesting for platforms for wineries like:

- Unserwein.at[2]

- Wein.cc[3]

- Euvino.eu[4]

If a platform supports the WDX XML, it will be able to read the permalink of the feed and will always get up-to-date information about your wines. As an explanation, the feed can be compared to a registry. The information is hierarchically stored in a tree and can be read by others.

Of course exporting wines as a file will have benefits, too. If, for example, you want to import the wines into another application or platform it will be a benefit to export the wines as a file.

After clicking on “Export”, the Avino data model gets mapped to WDX XML as described in section 7.2 and then gets exported.

[2] http://www.unserwein.at
[3] http://www.wein.cc
[4] http://www.euvino.eu

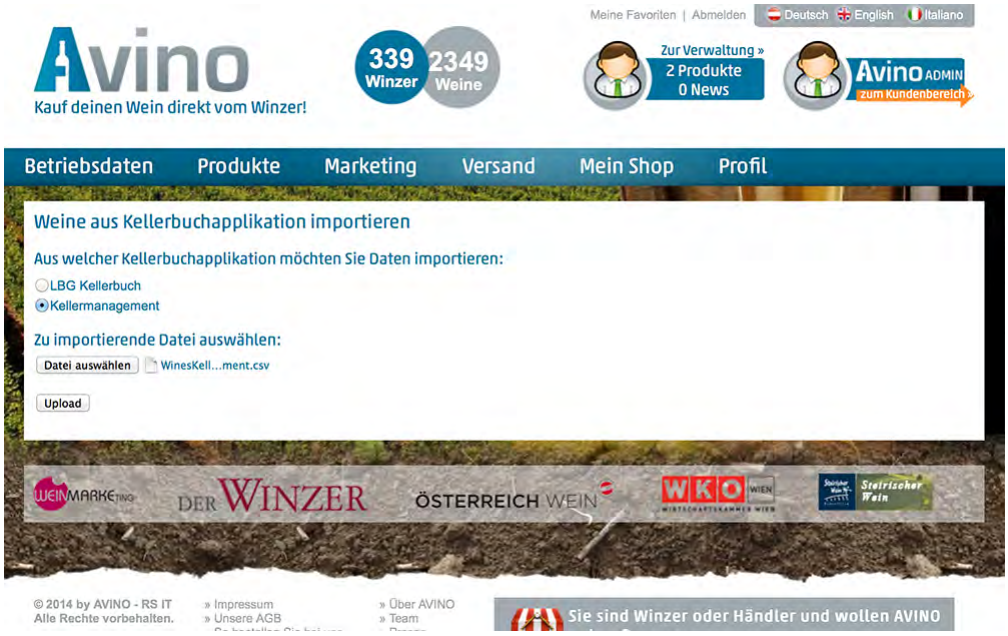


Figure 7.3: Choose the file for importing wines.

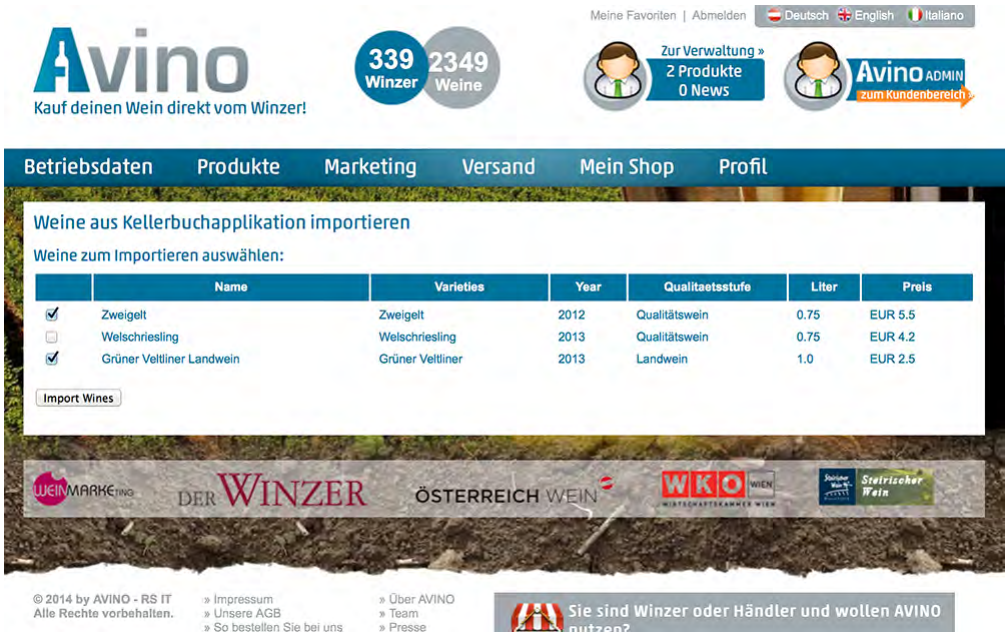


Figure 7.4: Choose the wines you want to import.

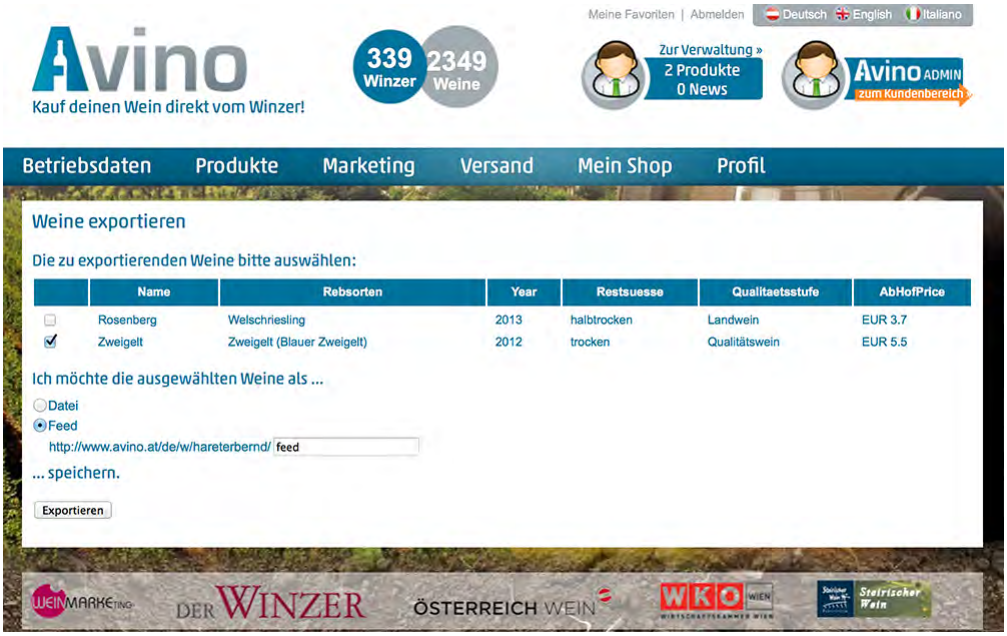


Figure 7.5: Choose the wines you want to export.

Figure 7.6: Example for a feed.

7.4 Conclusion

Hypothesis H.E1	**approved**
A prototype can be developed to show how the interface works.	
Because we have implemented a working prototype for our communication interface, we clearly proved this hypothesis.	

The prototype based on Java shows that the WDX interface will work under real conditions. For the development we take the XSD definition file and convert it to a Java class library with the help of JAXB. With this library we are now able to create XML files in the WDX format.

The prototype is a small program for the web-platform Avino. Wines stored in a proprietary format get converted to the WDX format and afterwards they can be imported to Avino. The prototype also support exports from Avino into the WDX format.

CHAPTER 8

Summary, Limitations and Future Work

8.1 Summary

The aim of this Master Thesis was to develop a data exchange interface for the wine industry. In order to accomplish this task, many steps had to be taken.

After a short introduction of the topic and the problem, research on related work is demonstrated. In the fields of electronic data interchange, ERP Systems, XML, Information Technology in viticulture and e-commerce a lot of work has already been done. Some of this work is discussed in the related work chapter.

After interviews with representatives of the *The Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management* and *Austrian Wine* we thought that there was a lack of information on computer and software usage in viticulture. For this reason we conducted an online survey for Austrian wineries. 232 wine-growers participated in our survey and answered questions about computer, software, marketing and e-commerce usage of Austrian wineries. Despite the doubts we had in the beginning, the survey showed that many Austrian wineries use computers for administrative tasks and their work in the cellar and in the vineyards. Especially the Austrian "Kellerbuch" is done on the computer by many wine-growers.

Having the results of the wine-survey, we analyzed the Top 3 Austrian cellar management applications (LBG Kellerbuch, DAS Kellerbuch and Kellermanagement) and one cellar management application from Germany (Weinbau-Online.de). The applications got evaluated regarding the services & features they offer and regarding their usability. Results of the evaluations have shown, that the applications support all services & features needed by wine-growers but the usability could be improved immense in the future. Most notably there are no mobile versions of the cellar management applications but mobile versions will be a must have any time soon. Taking all results into account, we ranked the applications regarding their scores as the following: 1. LBG Kellerbuch; 2. Weinbau-Online.de; 3. DAS Kellerbuch; 4. Kellermanagement.

Due to the fact that e-commerce processes of Austrian wineries focus on their websites, we analyzed 100 different winery websites regarding their web fitness. In the analysis the websites got tested in the categories *Winery Size*, *Technology & Services*, *Information*, *Search Engines*, *Browser Support* and *Look & Feel*. To make sure the analysis remains objective, the only subjective category was *Look & Feel*. The evaluation of the results showed, that winery websites in Austria are solidly average. Many websites include CMS systems and ways to order wines via the internet. The contents are informative and the look & feel of the websites is quite good. So we concluded that the need for a wine data communication interface, as WineDataXchng XML, for e-commerce tools will increase in the future.

With all the evaluation data of the previous analyses we were able to develop the communication interface. The XML based interface is called WineDataXchng Interface and has a modular design. The XML root element *wineries* can contain several *winery elements*. A winery itself stores all information which is needed, either about vineyards, wines, warehouses administrative reports or all of these. Depending on how it is used the modular design allows flexible communication. With the *administrative reports element*, the interface also contains a country specific module. Here, administrative reports for various countries can be defined.

Creating a prototype has been the last part of this Master Thesis. The Java based prototype showed that the interface will be usable for practical purposes. The prototype was included in Avino[1] and showed that two conceptual cases of use can work in practice. First of all wine data can be imported to Avino via WineDataXchng XML from various cellar management applications. Due to some data conversions, we also showed that the interface is extremely versatile. Wine data can also be exported from Avino either as an XML file or as data feed.

Hypothesis H.Main **approved**

No homogeneous communication interface between different systems in the wine industry exist.

All analyses results of the master thesis prove our main hypothesis. Related work exhibits that there have been only unsuccessful attempts to develop a communication interface for winery data in the past. The XML interfaces we found have not been able to be used for general purposes. The wine survey illustrates that many wine-growers are already using computer supported devices and processes in their wineries. The results also show, that the desire of wine-growers for new technologies in the future is rather high. Our CM application analysis shows that the applications include plenty services & features for the wine-growers but they do not provide interfaces to communicate with other applications/systems. Last, the website evaluation shows that a quarter of websites include a webshop and nearly 50% of the websites are based on a CMS system. All these facts let us conclude that a need for a generally applicable communication interface will increase in the next few years.

[1] http://www.avino.at

8.2 Limitations

The following tasks where not taken into account in this work:

- All evaluations and analyses of this master thesis are made by just one person. Therefore the results of those must be considered as limited.
- So far, all evaluations and tasks considered in this Master's thesis were optimized for the Austrian wine market. Nevertheless, the interface was developed for general purposes and could be used on an international level.
- As we only had access to test accounts for application tests, we weren't able to fully implement our prototype into a cellar management application. Therefore, the prototype contains semi-automated processes during data conversations. Despite that it is planned to integrate the interface into CM applications in the future.
- It also is not in the work-list of this thesis to bargain with cellar management application developers to implement the WDX interface. Also we don't implement a prototype WDX interface plugin for any CM application.
- The Java library we generated with JAXB is just a prototype. It was not part of the thesis to develop a fully usable Java library for converting data from and to the WDX format.

8.3 Future Work

The following list describes potential improvements and additional features for future work, which are not part of this Master's thesis:

- The WDX Interface is currently available in version 1.0. Due to technological progress it will be necessary to enhance the interface for the future. Main tasks will be the enhancement of the modules specific to certain countries and the way of storing awards.

- The current prototype includes a small Java based data mapper for the WDX Interface. For the future we want to develop mappers for other programming languages. The most important languages and development frameworks should be supported.

- We have also planned to develop a visual mapper for semi-automated data mapping. The user will have the possibility to load a wine data object into a graphical user interface where he/she can link the objects of a wine to the WDX elements. With this method the user can generate a customized data mapper between his proprietary wine object and the WDX format without the necessity of writing a line of code.

- If many applications and platforms support the WDX format, a big set of wine data in the same underlying format will be available. As a result of this, "big data" analyses will be possible. We have planned to gather as much wine data as possible and provide "big data" analyses for wineries.

- Due to the possibility of providing data feeds of wines, webshops will be able to cooperate with online recommendation systems. They can automatically read information on wines of a winery and customers can start to write recommendations. For the future it will be possible to use several recommendation platforms without having high maintenance efforts.

- We have ambitions to cooperate with the government to introduce the WDX Interface into their e-government applications. With automated processes between CM applications and e-government platforms, time and money could be saved on both sides, government and wineries.

Abbreviations

B2A	Business to Administration
B2B	Business to Business
B2C	Business to Customer
ERP System	Enterprise Resource Planning System
CM App	Cellar Management Application: The term "cellar management application" refers to ERP systems for wineries. The systems mentioned in this thesis support the administrative tasks for the Austrian "Kellerbuch" and beyond. Examples for other tasks are customer administration, invoice administration and others.
CMS	Content Management System
DTD	Document Type Definition
EDI	Electronic Data Interchange
ERP System	Enterprise Resource Planning System
HTML	Hypertext Markup Language
URL	Uniform Resource Locator
W3C	World Wide Web Consortium
WDX	WineDataExchange
XML	Extensible Markup Language
XSD	XML Schema Definition

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APPENDIX A

Analyses and Survey Data Tables

A.1 Wine Survey

In this part the data for statistical analyses of the wine survey is shown. The first and the second table depict the survey questions (table A.1) and the answering options for the question codes of multiple choice questions (table A.2). In tables A.3 to A.15 the answers given by survey participants are shown. To cut things short for every question and answering option, the table heads just show the question code. In results tables, 1 indicates *Yes* or *Selected*, 0 indicates *No* or *Not selected* and -1 stands for *Question not shown for this participant*.

ID	Topic/Question	Type
1	**Use of Computers**	
1.1	Do you have a PC with internet access?	yes/no
1.2	Do you have an application for doing the "Kellerbuch"	yes/no
1.2.y1	Which application do you use?	multiple choice
1.2.y2	What were the basic costs for your application?	single choice
1.2.y3	What are the annual costs for your application?	single choice
1.2.y4	Could the application you use be improved in any way?	text
1.2.n1	Why do you not use a computer for your "Kellerbuch"?	multiple choice
1.3	Do you use a computer for your sales records?	yes/no
1.3.y1	Which application do you use for your sales records?	text
1.4	Do you use a computer or computer supported devices in other areas of your winery?	multiple choice
1.4.y1	Which applications or systems do you use in those areas?	text
1.5	If you do not use a computer for various things now, will you use one within the next 3 years or do you think you aren't PC-fit enough?	yes/no
1.6	How do you administrate your customer data?	single choice
1.7	How do you administrate different prices for different customers?	single choice
1.8	Do you have partners/retailers that sell your wines with commission?	yes/no
1.8.y1	How do you administrate those commissions?	single choice
1.9	How do you write your customers invoices?	single choice
1.10	Which administrative tasks are you currently doing with the support of an application?	multiple choice
1.11	Which administrative tasks would you like to do with the help of an application if it was supported?	multiple choice
2	**Wein-Online (E-Government service in Austria)**	
2.1	Did you use Wein-Online to do your "Erntemeldung" at home, or did you get help from public administration?	single choice
2.2	Did you have difficulty in using "Wein-Online"? Was it rather easy or complicated?	single choice
2.3	Do you think there is a benefit of using "Wein-Online" compared to doing this on paper?	single choice
2.4	Do you trust in the service, or do you fear misuse of data because of sending it online?	single choice
2.5	Would you use "Wein-Online" for other purposes than the ones required by law?	yes/no
3	**(E-) Marketing**	
3.1	Do you have a website for your winery	yes/no

ID	Topic/Question	Type
3.1.n1	Why do you not have a website for your winery?	multiple choice
3.2	Do you send newsletters to your customers?	yes/no
3.2.y1	Which application do you use for creating and sending your newsletters?	multiple choice
3.3	Do you have a webshop where customers can buy your products?	yes/no
3.3.y1	Is your webshop a standard shop or is it adapted to special needs?	single choice
3.3.y2	Do you know the technology your webshop is based on?	single choice
3.3.n1	Why don't you have a webshop?	multiple choice
3.4	Do you use any third party webshops to sell your products?	yes/no
3.4.y1	Which third party webshops do you use?	multiple choice
3.4.n1	Do you know that there is the possibility to sell wines in third party webshops?	yes/no
3.5	Do you sell your products via a partner/retailer?	yes/no
3.6	Do you sell your products via supermarkets?	yes/no
3.7	Which classic distribution channels do you use for selling your wines?	multiple choice
3.8	Is your winery present in some social media platforms?	multiple choice
3.9	How often do you think you have to type in the same data for one wine in different forms? (Think of contests, webshops, social media, ...)	single choice
3.10	Do you plan to use a website/webshop/third party shops or social media within the next 3 years?	multiple choice
4	**Future computer usage scenarios**	
4.1	Can you imagine some future scenarios?	matrix
4.2	If you cannot imagine those scenarios, why not?	multiple choice
5	**Demographic Data**	
5.1	In which wine-growing region of Austria are you located?	single choice
5.2	What's the size of your vineyard acreage?	text
5.3	How many bottles do you produce annually?	text
5.4	Are you doing viniculture as your main job?	yes/no
5.5	Gender	single choice
5.6	Age	single choice

Table A.1: Wine Survey Questions. ***Note:*** *IDs with literals indicate conditionally bounded questions. Y means that the question occurs if the previous question was answered with ‚Yes', N is dedicated to ‚No'.*

Question Code	Answer Option	Question Code	Answer Option
1.2.y1.a1	LBG Kellerbuch	3.1.n1.a3	I don't have enough PC knowledge
1.2.y1.a2	DAS Kellerbuch	3.1.n1.a4	I see no benefit in a website
1.2.y1.a3	Kellermanagement	3.1.n1.a5	Current business takeover
1.2.y1.a4	Vinosoft	3.1.n1.a6	Currently in development
1.2.y1.a5	Excel	3.3.n1.a1	Costs are too high
1.2.y1.a6	Own solution	3.3.n1.a2	There is no customer wish
1.2.y1.a7	Others	3.3.n1.a3	I don't have enough PC knowledge
1.2.n1.a1	I don't have enough PC knowledge	3.3.n1.a4	I wasn't aware of the possibility
1.2.n1.a2	I'm afraid of data loss	3.3.n1.a5	Too much effort
1.2.n1.a3	Writting it manually is easier	3.3.n1.a6	Too much price transparency
1.2.n1.a4	Costs are too high	3.3.n1.a7	Currently in development
1.2.n1.a5	Currently in development	3.3.n1.a8	Others
1.2.n1.a6	Others	3.4.y1.a1	Avino
1.4.a1	In the cellar	3.4.y1.a2	eBay
1.4.a2	In the vineyards	3.4.y1.a3	Amazon
1.4.a3	On the tractor	3.4.y1.a4	Weintipps
1.4.a4	On farming devices	3.4.y1.a5	Weingrube
1.4.a5	Others	3.4.y1.a6	Vinorama
1.10.a1	Customer administration	3.4.y1.a7	Others
1.10.a2	Product administration	3.7.a1	Sale by producer on premises
1.10.a3	Commission administration	3.7.a2	Deliver wine by myself
1.10.a4	Stock administration	3.7.a3	Shipping
1.10.a5	Price list administration	3.7.a4	Wine store
1.10.a6	Reservation administration	3.7.a5	Wine merchant
1.10.a7	Order administration	3.7.a6	Restaurant
1.10.a8	Delivery note administration	3.7.a7	Export
1.10.a9	Invoice administration	3.7.a8	Others
1.10.a10	Dun administration	3.8.a1	Twitter
1.10.a11	Refund administration	3.8.a2	Facebook
1.10.a12	Bulk wine administration	3.8.a3	Google+
1.10.a13	Consignment bill administration	3.8.a4	LinkedIn
1.10.a14	Proforma invoice administration	3.8.a5	Xing

Question Code	Answer Option	Question Code	Answer Option
1.10.a15	Buying in administration	3.8.a6	MySpace
1.10.a16	Others	3.8.a7	Unserwein.at
1.11.a1	Customer administration	3.8.a8	Others
1.11.a2	Product administration	3.10.a1	Website
1.11.a3	Commission administration	3.10.a2	Webshop
1.11.a4	Stock administration	3.10.a3	3rd Party Webshop
1.11.a5	Price list administration	3.10.a4	Social Media
1.11.a6	Reservation administration	4.1.a1	Do the cellar book with a PC
1.11.a7	Order administration	4.1.a2	Send government reports online
1.11.a8	Delivery note administration	4.1.a3	Automatical product uploads
1.11.a9	Invoice administration	4.1.a4	Send wine data without filling in a form
1.11.a10	Dun administration	4.1.a5	Sales reports via a tablet PC
1.11.a11	Refund administration	4.2.a1	I don't want to use a computer
1.11.a12	Bulk wine administration	4.2.a2	I don't trust in this kind of technology
1.11.a13	Consignment bill administration	4.2.a3	I'm afraid of losing control due to automation
1.11.a14	Proforma invoice administration	4.2.a4	Costs are too high
1.11.a15	Buying in administration	4.2.a5	Winery is too small
3.1.n1.a1	There is no customer wish	4.2.a6	Too much effort
3.1.n1.a2	Costs are too high	4.2.a7	Others

Table A.2: Mapping table for question codes and answer options of survey questions.

#	Question Code										
	1.1	**1.2**	**1.2.y1.a1**	**1.2.y1.a2**	**1.2.y1.a3**	**1.2.y1.a4**	**1.2.y1.a5**	**1.2.y1.a6**	**1.2.y1.a7**	**1.2.y2**	**1.2.y3**
1	1	1	0	0	0	0	0	1	0	< €500	€100 - €250
2	1	1	1	0	0	0	0	0	0	€500 - €1000	€251 - €500
3	1	0	0	0	0	0	0	0	0		
4	1	1	0	0	0	1	0	0	0	€2001 - €2500	€501 - €750
5	1	1	0	0	1	0	0	0	0	€500 - €1000	< €100
6	1	0	0	0	0	0	0	0	0		
7	1	1	0	0	1	0	0	0	0	< €500	€100 - €250
8	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
9	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
10	1	1	1	0	0	0	0	0	0	< €500	< €100
11	1	1	0	0	1	0	0	0	0	< €500	< €100
12	1	1	0	0	1	0	0	0	0	< €500	< €100
13	1	1	1	0	0	0	0	0	0	< €500	< €100
14	1	1	1	0	0	0	0	0	0		
15	1	1	1	0	0	0	0	0	0		
16	1	1	0	0	1	0	0	0	0	€500 - €1000	< €100
17	1	1	0	0	0	0	0	1	0		< €100
18	1	1	1	0	0	0	0	0	0	€1501 - €2000	€251 - €500
19	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
20	1	1	1	0	0	0	0	0	0	€500 - €1000	€251 - €500
21	1	1	1	0	0	0	0	0	0	€1001 - €1500	€251 - €500
22	1	1	0	0	0	0	0	1	0	< €500	< €100
23	1	0	0	0	0	0	0	0	0		
24	1	1	0	0	0	1	0	0	0	> €3000	< €100
25	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
26	1	1	0	0	0	0	0	0	1	> €3000	> €1000
27	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
28	1	1	1	0	0	0	0	0	0		< €100
29	1	1	0	0	0	0	0	0	1	€2001 - €2500	€100 - €250
30	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
31	1	0	0	0	0	0	0	0	0		
32	1	1	0	0	1	0	0	0	0	< €500	< €100
33	1	1	1	0	0	0	0	0	0	€1501 - €2000	€251 - €500
34	1	1	1	0	0	0	0	0	0	< €500	< €100
35	1	0	0	0	0	0	0	0	0		
36	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
37	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
38	1	1	0	0	1	0	0	0	0		< €100
39	1	1	1	0	0	0	0	0	0	€2001 - €2500	€100 - €250
40	1	1	0	0	1	0	0	0	0	€1501 - €2000	€100 - €250
41	1	1	0	0	0	0	0	1	0	< €500	< €100
42	1	0	0	0	0	0	0	0	0		
43	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250

#	Question Code										
	1.1	1.2	1.2.y1.a1	1.2.y1.a2	1.2.y1.a3	1.2.y1.a4	1.2.y1.a5	1.2.y1.a6	1.2.y1.a7	1.2.y2	1.2.y3
44	1	1	0	0	0	0	1	0	0	< €500	
45	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
46	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
47	1	1	0	0	0	0	0	1	0	< €500	< €100
48	1	1	0	0	0	0	1	0	0	< €500	< €100
49	1	1	1	0	0	0	0	0	0	€1001 - €1500	< €100
50	1	1	0	1	0	0	0	0	0	€1501 - €2000	> €1000
51	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
52	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
53	1	0	0	0	0	0	0	0	0		
54	1	1	0	0	0	0	0	1	0	< €500	< €100
55	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
56	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
57	1	0	0	0	0	0	0	0	0		
58	1	1	1	0	0	0	0	0	0		< €100
59	1	0	0	0	0	0	0	0	0		
60	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
61	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
62	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
63	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
64	1	1	1	0	0	0	0	0	0	€1501 - €2000	€251 - €500
65	1	1	1	0	0	0	0	0	0	< €500	< €100
66	1	1	1	0	0	0	0	0	0	€500 - €1000	€251 - €500
67	1	0	0	0	0	0	0	0	0		
68	1	0	0	0	0	0	0	0	0		
69	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
70	1	0	0	0	0	0	0	0	0		
71	1	1	0	0	0	0	1	0	0	< €500	< €100
72	1	0	0	0	0	0	0	0	0		
73	1	1	0	0	0	0	1	0	0		
74	1	0	0	0	0	0	0	0	0		
75	1	0	0	0	0	0	0	0	0		
76	1	1	1	0	0	0	0	0	0	€500 - €1000	€251 - €500
77	1	1	0	0	1	0	0	0	0		€100 - €250
78	1	1	1	0	0	0	0	0	0	€1001 - €1500	€251 - €500
79	1	1	1	0	0	0	0	0	0	€1501 - €2000	€100 - €250
80	1	0	0	0	0	0	0	0	0		
81	1	1	1	0	0	0	0	0	0	€1501 - €2000	€100 - €250
82	1	1	0	0	1	0	0	0	0		€100 - €250
83	1	0	0	0	0	0	0	0	0		
84	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
85	1	1	1	0	0	0	0	0	0	< €500	< €100
86	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
87	1	1	1	0	0	0	0	0	0	€1001 - €1500	€251 - €500
88	1	1	0	0	0	0	1	0	0		
89	1	0	0	0	0	0	0	0	0		
90	1	1	0	0	0	0	1	0	0	< €500	< €100
91	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
92	1	1	1	0	0	0	0	0	0	€500 - €1000	€251 - €500
93	1	1	1	0	0	0	1	0	0	€2501 - €3000	€251 - €500
94	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
95	1	0	0	0	0	0	0	0	0		
96	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
97	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
98	1	1	1	0	0	0	0	0	0	€1501 - €2000	€100 - €250
99	1	1	0	0	0	0	1	0	0	< €500	< €100
100	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
101	1	1	1	0	0	0	0	0	0	€1501 - €2000	€100 - €250
102	1	1	1	0	0	0	0	0	0		
103	1	0	0	0	0	0	0	0	0		
104	1	1	1	0	0	0	0	0	0	> €3000	> €1000
105	1	1	1	0	0	0	0	0	0	€500 - €1000	€251 - €500
106	1	0	0	0	0	0	0	0	0		
107	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
108	1	1	1	0	0	0	0	0	0	€1501 - €2000	€251 - €500
109	1	1	1	0	0	0	0	0	0	> €3000	€100 - €250
110	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
111	1	0	0	0	0	0	0	0	0		
112	1	1	1	0	0	0	0	0	0	€1501 - €2000	€100 - €250
113	1	0	0	0	0	0	0	0	0		

#	Question Code										
	1.1	**1.2**	**1.2.y1.a1**	**1.2.y1.a2**	**1.2.y1.a3**	**1.2.y1.a4**	**1.2.y1.a5**	**1.2.y1.a6**	**1.2.y1.a7**	**1.2.y2**	**1.2.y3**
114	1	1	0	0	0	0	1	0	0		
115	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
116	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
117	1	1	1	0	0	0	0	0	0	€2001 - €2500	€251 - €500
118	1	1	0	0	0	0	0	0	0	< €500	
119	1	1	1	0	0	0	0	0	0	€500 - €1000	
120	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
121	1	1	1	0	0	0	0	0	0	€1001 - €1500	€251 - €500
122	1	1	0	1	0	0	0	0	0	€2501 - €3000	> €1000
123	1	0	0	0	0	0	0	0	0		
124	1	0	0	0	0	0	0	0	0		
125	1	1	1	0	0	0	0	0	0	< €500	
126	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
127	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
128	1	1	0	0	0	0	1	0	0	< €500	< €100
129	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
130	1	1	1	0	0	0	0	0	0	€500 - €1000	€251 - €500
131	1	1	0	0	0	0	0	1	0		
132	1	0	0	0	0	0	0	0	0		
133	1	1	0	0	0	1	0	0	0	> €3000	€751 - €1000
134	1	1	0	1	0	0	0	0	0	> €3000	> €1000
135	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
136	1	1	1	0	0	0	0	0	0		< €100
137	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
138	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
139	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
140	1	1	1	0	0	0	0	0	0	€500 - €1000	€501 - €750
141	1	1	0	0	0	0	0	0	1	> €3000	€251 - €500
142	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
143	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
144	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
145	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
146	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
147	1	1	0	0	0	0	0	0	1	> €3000	€100 - €250
148	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
149	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
150	1	1	0	0	0	0	0	0	1	> €3000	€751 - €1000
151	1	0	0	0	0	0	0	0	0		
152	1	0	0	0	0	0	0	0	0		
153	1	0	0	0	0	0	0	0	0		
154	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
155	1	0	0	0	0	0	0	0	0		
156	1	1	0	0	0	0	0	1	0	< €500	< €100
157	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
158	1	0	0	0	0	0	0	0	0		
159	1	1	0	0	0	0	1	0	0	< €500	< €100
160	1	0	0	0	0	0	0	0	0		
161	1	0	0	0	0	0	0	0	0		
162	1	0	0	0	0	0	0	0	0		
163	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
164	1	1	0	1	1	0	0	0	0	€2001 - €2500	
165	1	1	0	0	0	0	1	0	0	< €500	< €100
166	1	0	0	0	0	0	0	0	0		
167	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
168	1	1	0	0	0	1	0	0	0		> €1000
169	1	0	0	0	0	0	0	0	0		
170	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
171	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
172	1	1	1	0	1	0	0	0	0	€1501 - €2000	€251 - €500
173	1	0	0	0	0	0	0	0	0		
174	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
175	1	1	1	0	0	0	0	0	0	€500 - €1000	< €100
176	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
177	1	1	1	0	0	0	0	0	0	€500 - €1000	€251 - €500
178	1	1	1	0	0	0	0	0	0		
179	1	0	0	0	0	0	0	0	0		
180	1	0	0	0	0	0	0	0	0		
181	1	1	0	0	1	0	0	0	0	< €500	
182	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
183	1	0	0	0	0	0	0	0	0		

#	Question Code										
	1.1	**1.2**	**1.2.y1.a1**	**1.2.y1.a2**	**1.2.y1.a3**	**1.2.y1.a4**	**1.2.y1.a5**	**1.2.y1.a6**	**1.2.y1.a7**	**1.2.y2**	**1.2.y3**
184	1	0	0	0	0	0	0	0	0		
185	1	0	0	0	0	0	0	0	0		
186	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
187	1	1	1	0	0	0	0	0	0	< €500	< €100
188	1	0	0	0	0	0	0	0	0		
189	1	1	0	0	0	0	1	0	0		
190	1	0	0	0	0	0	0	0	0		
191	1	0	0	0	0	0	0	0	0		
192	1	1	0	0	0	0	0	1	0	< €500	< €100
193	1	0	0	0	0	0	0	0	0		
194	1	1	0	0	0	0	1	0	0	< €500	< €100
195	1	1	1	0	0	0	0	1	0	€2501 - €3000	€100 - €250
196	1	1	1	0	0	0	0	0	0	< €500	< €100
197	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
198	1	1	0	0	0	0	1	0	0	< €500	< €100
199	1	1	1	0	0	0	0	0	0	< €500	< €100
200	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
201	1	0	0	0	0	0	0	0	0		
202	1	1	1	0	0	0	0	0	0	< €500	< €100
203	1	1	1	0	0	0	0	0	0	€1001 - €1500	€100 - €250
204	1	0	0	0	0	0	0	0	0		
205	1	1	0	1	0	0	0	0	0	€2001 - €2500	> €1000
206	1	1	0	0	0	0	0	1	0	< €500	< €100
207	1	1	0	0	0	0	1	0	0	< €500	< €100
208	1	0	0	0	0	0	0	0	0		
209	1	0	0	0	0	0	0	0	0		
210	1	1	0	0	0	0	1	0	0	< €500	< €100
211	1	0	0	0	0	0	0	0	0		
212	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
213	1	1	0	0	1	0	0	0	0	€500 - €1000	€100 - €250
214	1	1	1	0	0	0	0	0	0	< €500	< €100
215	1	1	1	0	0	0	0	0	0	< €500	< €100
216	1	0	0	0	0	0	0	0	0		
217	1	1	0	0	1	0	0	0	0	< €500	< €100
218	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
219	1	1	1	0	0	0	0	0	0		
220	1	1	1	0	0	0	0	0	0	< €500	€100 - €250
221	1	0	0	0	0	0	0	0	0		
222	1	0	0	0	0	0	0	0	0		
223	1	0	0	0	0	0	0	0	0		
224	1	0	0	0	0	0	0	0	0		
225	1	1	1	0	0	0	0	0	0		
226	1	1	1	0	0	0	0	0	0	€500 - €1000	€100 - €250
227	1	1	1	0	0	0	0	0	0		€251 - €500
228	1	1	0	0	1	0	0	0	0		€100 - €250
229	1	1	0	0	0	0	0	0	1	< €500	< €100
230	1	0	0	0	0	0	0	0	0		
231	1	0	0	0	0	0	0	0	0		
232	1	1	0	0	1	0	0	0	0		< €100
233	1	1	0	0	1	0	0	0	0		

Table A.3: Survey participant answers for questions 1.1 to 1.2.y3

#	Question Code								
	1.2.y4	**1.2.n1.a1**	**1.2.n1.a2**	**1.2.n1.a3**	**1.2.n1.a4**	**1.2.n1.a5**	**1.2.n1.a6**	**1.3**	**1.3.y1**
1	wird laufend nach Rücksprache mit Entwickler aktualisiert	0	0	0	0	0	0	1	propriatary development
2	Sehr viel!	0	0	0	0	0	0	1	LBG Kellerbuch
3		1	0	0	0	0	0	0	
4	ja	0	0	0	0	0	0	1	
5		0	0	0	0	0	0	1	Kellermanagement (Mauß)
6		0	0	1	1	0	0	1	Microsoft Excel
7	nein	0	0	0	0	0	0	1	Kellermanagement (Mauß)
8	ja	0	0	0	0	0	0	1	Kellermanagement (Mauß)
9	immer Kleinigkeiten	0	0	0	0	0	0	1	LBG Kellerbuch

#	Question Code								
	1.2.y4	**1.2.n1.a1**	**1.2.n1.a2**	**1.2.n1.a3**	**1.2.n1.a4**	**1.2.n1.a5**	**1.2.n1.a6**	**1.3**	**1.3.y1**
10		0	0	0	0	0	0	1	LBG Kellerbuch
11	verbessern kann mit immer etwas, funktioniert momentan ganz gut	0	0	0	0	0	0	1	Kellermanagement (Mauß)
12	ja	0	0	0	0	0	0	1	
13		0	0	0	0	0	0	1	
14		0	0	0	0	0	0	1	
15	Webaccess	0	0	0	0	0	0	1	LBG Kellerbuch
16	Natürlich. Wie bei jeder Software gibt es immer Verbesserungsbedarf. Vor allem die Useability könnte stark verbessert werden.	0	0	0	0	0	0	1	Kellermanagement (Mauß)
17	Ja.	0	0	0	0	0	0	1	Microsoft Excel
18		0	0	0	0	0	0	1	
19		0	0	0	0	0	0	1	Keynote
20	Ja	0	0	0	0	0	0	1	LBG Kellerbuch
21	Sehr viel	0	0	0	0	0	0	1	LBG Kellerbuch
22		0	0	0	0	0	0	1	
23		0	0	1	0	0	0	1	Microsoft Excel
24		0	0	0	0	0	0	1	Vinosoft
25	ja	0	0	0	0	0	0	1	Kellermanagement (Mauß)
26	derzeit nicht	0	0	0	0	0	0	1	WEGA
27	Nein	0	0	0	0	0	0	1	LBG Kellerbuch
28		0	0	0	0	0	0	0	
29	JA	0	0	0	0	0	0	1	Holzer Kellerbuch
30	ja	0	0	0	0	0	0	1	LGB Kellerbuch
31		1	0	0	1	0	0	1	Kellerbuch AV
32	Herr Ing. Mauß macht es exelent	0	0	0	0	0	0	1	Kellermanagement (Mauß)
33	Mobilität und Eingabe per Smartphone Apps fehlt.	0	0	0	0	0	0	1	LBG Kellerbuch
34	benutzerfreundlichere Erfassung	0	0	0	0	0	0	0	
35		0	0	0	0	0	1	1	Microsoft Excel
36		0	0	0	0	0	0	1	LBG Kellerbuch
37		0	0	0	0	0	0	1	LBG Kellerbuch
38		0	0	0	0	0	0	1	LBG Kellerbuch
39	nein	0	0	0	0	0	0	1	LBG Kellerbuch
40	es wir ein jährliches update gemacht und das finde ich ok	0	0	0	0	0	0	1	Kellermanagement (Mauß)
41	Jede Menge ... (habe aber keine Zeit dafür)	0	0	0	0	0	0	1	Bonissimo
42		1	1	0	0	0	0	0	
43	Ja!	0	0	0	0	0	0	0	
44		0	0	0	0	0	0	1	Tipos
45	Für kleinere Betriebe sollte es eine einfachere Version geben.	0	0	0	0	0	0	0	
46	Aufgrund der updatekosten verwenden wir noch nicht die neueste Version von LBG. Wünschenswert wäre eine Möglichkeit die Daten in einer SQL Datenbank zu speichern und Schnittstellen zu anderen Kassenprogrammen.	0	0	0	0	0	0	1	LBG Kellerbuch / AIDA POS Kassensystem
47		0	0	0	0	0	0	0	
48	ich überlege die anschaffung eines kellerbuchprogramm, da gewisse abläufe einfacher sind	0	0	0	0	0	0	1	Microsoft Excel
49	Nein	0	0	0	0	0	0	1	
50	nichts gravierendes, es gibt ständige weiterentwicklung	0	0	0	0	0	0	1	Das Kellerbuch / Die Warenwirtschaft
51	Ja vor allem im Bereich der Übersichtlichkeit	0	0	0	0	0	0	1	LBG Kellerbuch / Microsoft Excel
52	Ja	0	0	0	0	0	0	1	LBG Kellerbuch
53		0	1	1	0	0	0	0	

#	Question Code								
	1.2.y4	**1.2.n1.a1**	**1.2.n1.a2**	**1.2.n1.a3**	**1.2.n1.a4**	**1.2.n1.a5**	**1.2.n1.a6**	**1.3**	**1.3.y1**
54	Könnte sicher professioneller sein, aber für unseren Betrieb ist es ausreichend	0	0	0	0	0	0	1	Microsoft Excel
55		0	0	0	0	0	0	1	LBG Kellerbuch
56	Nein	0	0	0	0	0	0	1	LBG Kellerbuch
57		0	0	1	1	0	0	0	
58		0	0	0	0	0	0	1	LBG Kellerbuch
59		0	0	0	0	1	0	0	
60	nein	0	0	0	0	0	0	1	Kellermanagement (Mauß)
61	Dafür arbeite ich zu wenig mit dem Programm.	0	0	0	0	0	0	1	LBG Kellerbuch
62	Version für Online Programm (über Server)	0	0	0	0	0	0	1	LBG Kellerbuch
63	Ja, immer	0	0	0	0	0	0	1	LBG Kellerbuch
64	ja	0	0	0	0	0	0	1	LBG Kellerbuch
65		0	0	0	0	0	0	1	LBG Kellerbuch
66	JA	0	0	0	0	0	0	1	LBG Kellerbuch
67		0	0	1	0	0	0	0	
68		0	0	0	0	1	0	0	
69	ja	0	0	0	0	0	0	1	
70		0	1	1	0	0	0	0	
71	Nein	0	0	0	0	0	0	1	Microsoft Excel
72		1	0	0	0	0	1	1	Microsoft Word
73		0	0	0	0	0	0	0	
74		0	0	1	0	0	0	1	LBG Moneymaker / Microsoft Excel
75		0	0	0	1	0	0	1	
76	ja	0	0	0	0	0	0	0	
77	Ja sicher!!	0	0	0	0	0	0	1	Kellermanagement (Mauß)
78		0	0	0	0	0	0	0	
79		0	0	0	0	0	0	1	LBG Kellerbuch
80		1	0	0	0	0	0	0	
81		0	0	0	0	0	0	1	LBG Kellerbuch
82		0	0	0	0	0	0	1	Kellermanagement (Mauß)
83		1	0	0	0	0	0	0	
84		0	0	0	0	0	0	1	
85		0	0	0	0	0	0	1	LBG Kellerbuch
86	Nein	0	0	0	0	0	0	1	LBG Kellerbuch
87	nein	0	0	0	0	0	0	1	LGB Kellerbuch / Tipos
88	nein	0	0	0	0	0	0	1	Microsoft Excel
89		0	0	0	1	0	0	1	PIDA Faktura
90		0	0	0	0	0	0	1	Microsoft Excel
91		0	0	0	0	0	0	1	Kellermanagement (Mauß)
92	Englischsprachige Ausdrucke von Rechnung und Lieferschein. Packlisten mit Gewicht, Position. Anbindung online an eVD ...	0	0	0	0	0	0	1	LBG Kellerbuch
93	Ja	0	0	0	0	0	0	1	LBG Kellerbuch

#	Question Code								
	1.2.y4	**1.2.n1.a1**	**1.2.n1.a2**	**1.2.n1.a3**	**1.2.n1.a4**	**1.2.n1.a5**	**1.2.n1.a6**	**1.3**	**1.3.y1**
94	Ja! Wir verwenden die aktuelle Version des LBG Kellerbuch Pro. Die Aufzeichnung der Behandlungsmittel und die Dokumentation der Arbeiten im Weinkeller für die Nachverfolgbarkeit der Produktion ist sehr umständlich und aufwendig! Es wäre sehr hilfreich wenn eine Behandlungsmitteldatenbank im Programm integriert wäre! Registrierkassa hat auch eineige Schwächen. Modul für Zimmervermieter wäre auch eine gute Ergänzung. Generell sollten die Programmierer doch mehr auf die Wünsche der Anwender eingehen.	0	0	0	0	0	0	1	LBG Kellerbuch
95		0	0	1	1	0	0	1	Microsoft Excel
96	ja	0	0	0	0	0	0	1	LBG Kellerbuch
97	Ja, sehr viel.	0	0	0	0	0	0	1	LBG Kellerbuch
98	Ja	0	0	0	0	0	0	1	LBG Kellerbuch
99	nein	0	0	0	0	0	0	1	Microsoft Excel
100		0	0	0	0	0	0	1	LBG Kellerbuch
101	Ja	0	0	0	0	0	0	1	LBG Kellerbuch
102	Vieles!	0	0	0	0	0	0	0	
103		0	0	1	0	0	1	1	Microsoft Excel
104	es kann immer was verbessert werden!!!	0	0	0	0	0	0	1	propriatary development
105	ja durchaus, verwende die ältere version des lbg-kellerbuches. hier geschehen bei der eingabe der ernte, bzw. traubenverkauf, sowie gebinde und artikel öfter ungereimtheiten	0	0	0	0	0	0	1	LBG Kellerbuch
106		0	0	0	1	0	0	1	Microsoft Excel
107		0	0	0	0	0	0	1	LBG Kellerbuch
108		0	0	0	0	0	0	1	LBG Kellerbuch
109		0	0	0	0	0	0	0	
110	JA Das weindatenblatt	0	0	0	0	0	0	1	LBG Kellerbuch
111		1	0	0	0	0	0	0	
112		0	0	0	0	0	0	1	LBG Kellerbuch
113		0	0	0	1	0	0	0	
114		0	0	0	0	0	0	0	
115	Übersicht und Datenübernahme für Rechnungslegung	0	0	0	0	0	0	1	LBG Kellerbuch
116	Ja, Lagerstandsübersicht und Rechnungen (Statistiken), Kundendatenverwaltung etc.	0	0	0	0	0	0	1	LBG Kellerbuch
117		0	0	0	0	0	0	1	LBG Kellerbuch
118		0	0	0	0	0	0	1	Kellermanagement (Mauß)
119		0	0	0	0	0	0	1	LBG Kellerbuch / LBG Money Maker
120		0	0	0	0	0	0	1	LBG Kellerbuch
121	es können die Programme immer verbessert werden, nur kommt man erst darauf wenn man arbeitet damit	0	0	0	0	0	0	1	LBG Kellerbuch
122		0	0	0	0	0	0	1	DIE Warenwirtschaft
123		0	0	0	1	0	0	1	Microsoft Excel
124		0	0	1	0	0	0	0	
125		0	0	0	0	0	0	1	LBG Kellerbuch
126	Nein	0	0	0	0	0	0	1	LBG Kellerbuch
127		0	0	0	0	0	0	1	LBG Kellerbuch
128		0	0	0	0	0	0	0	
129		0	0	0	0	0	0	1	Kellermanagement (Mauß)

#	Question Code								
	1.2.y4	**1.2.n1.a1**	**1.2.n1.a2**	**1.2.n1.a3**	**1.2.n1.a4**	**1.2.n1.a5**	**1.2.n1.a6**	**1.3**	**1.3.y1**
130		0	0	0	0	0	0	1	LBG Kellerbuch
131	kann jederzeit geändert werden	0	0	0	0	0	0	1	Microsoft Access
132		1	0	0	0	0	0	0	
133	JA, einfachere Handhabe	0	0	0	0	0	0	1	Vinosoft
134	NEIN!	0	0	0	0	0	0	1	DIE Warenwirtschaft
135	Rückverfolgbarkeit der Weinbehandlungen!	0	0	0	0	0	0	1	LBG Kellerbuch
136	JA, einiges im Bereich Rechnungslegung und Kundenverwaltung bzw. Versand von Newslettern	0	0	0	0	0	0	1	LBG Kellerbuch
137	Ja das ganze Programm gehört neu Programmiert! Deshalb werden wir auch zu das Kellerbuch wechseln!	0	0	0	0	0	0	1	LBG Kellerbuch
138		0	0	0	0	0	0	1	
139		0	0	0	0	0	0	1	Kellermanagement (Mauß)
140	Ja sicher, man findet immer wieder Möglichkeiten um zu verbessern!	0	0	0	0	0	0	1	LBG Kellerbuch
141	Nein, das Programm ist sehr gut. Es stammt von der Firma Soppe+Partner aus Deutschland, ist für Österreich adaptiert und umfasst alle Bereiche der Wein- und Betriebswirtschaft von Traubenübernahme, Kellerbuch, Lagerverwaltung, Füllplanung, Kundenverwaltung, Auftragswesen, Komission, Finanzbuchhaltung und Statistik.	0	0	0	0	0	0	1	APYS
142	Ja, man sollte Situationen zB Verschnitte oder Behandlungen simulieren können bevor man sie im Keller macht und das Kellerbuch sollte sofort warnen wenn erlaubte Werte überschritten werden.	0	0	0	0	0	0	1	LBG Kellerbuch
143	Sehr sehr viel.	0	0	0	0	0	0	1	Microsoft Excel
144		0	0	0	0	0	0	1	LBG Kellerbuch
145		0	0	0	0	0	0	1	LBG Kellerbuch
146		0	0	0	0	0	0	1	LBG Kellerbuch
147		0	0	0	0	0	0	1	MS Navision
148	vieles	0	0	0	0	0	0	1	Kellermanagement (Mauß)
149	CRM - Verknüpfung von Kundeninformation! Reminder Funktion - Telefonate aufzeichnen, Wichtig!!!!	0	0	0	0	0	0	1	LBG Kellerbuch
150	Ja	0	0	0	0	0	0	1	Holzer Kellerbuch
151		0	0	1	0	0	0	1	LBG Kellerbuch
152		0	0	0	1	0	0	1	Microsoft Excel
153		0	0	1	1	0	0	1	Microsoft Excel
154		0	0	0	0	0	0	1	LBG Kellerbuch
155		0	1	0	1	0	0	1	Microsoft Excel
156	Ja	0	0	0	0	0	0	1	Microsoft Access
157		0	0	0	0	0	0	1	LBG Kellerbuch
158		0	0	0	1	0	0	0	
159		0	0	0	0	0	0	1	Kassa Boniersystem
160		1	0	0	0	0	0	0	
161		1	0	0	0	0	0	0	
162		0	1	1	0	0	0	0	
163	ja	0	0	0	0	0	0	1	Microsoft Excel

#	Question Code								
	1.2.y4	**1.2.n1.a1**	**1.2.n1.a2**	**1.2.n1.a3**	**1.2.n1.a4**	**1.2.n1.a5**	**1.2.n1.a6**	**1.3**	**1.3.y1**
164	ja, natürlich könnte man das Programm individuell auf den jeweiligen Betrieb abstimmen, aber das ist natürlich sehr schwierig zu verwirklichen	0	0	0	0	0	0	1	DAS Kellerbuch
165	nein	0	0	0	0	0	0	1	Microsoft Excel
166		0	0	1	0	0	0	1	Microsoft Excel
167		0	0	0	0	0	0	1	LBG Kellerbuch
168	ja - Anpassungen sind natürlich laufend notwendig	0	0	0	0	0	0	1	Vinosoft
169		1	0	1	0	0	0	0	
170		0	0	0	0	0	0	1	Explorer
171	nein	0	0	0	0	0	0	1	Microsoft Access
172	nein	0	0	0	0	0	0	0	
173		1	0	1	0	0	0	0	
174		0	0	0	0	0	0	1	LBG Kellerbuch
175	nein	0	0	0	0	0	0	1	LBG Kellerbuch
176	durch ständiges update ist das programm immer aktuell	0	0	0	0	0	0	1	LBG Kellerbuch
177	ja	0	0	0	0	0	0	1	LBG Kellerbuch
178		0	0	0	0	0	0	0	
179		0	0	1	0	0	0	0	
180		0	0	1	1	0	0	0	
181		0	0	0	0	0	0	0	
182	Ja, ich habe noch die alte Version, es gibt eine neue	0	0	0	0	0	0	1	LBG Kellerbuch
183		1	1	1	0	0	0	0	
184		0	0	0	1	0	0	0	
185		0	0	0	0	0	1	1	Microsoft Excel
186		0	0	0	0	0	0	1	LBG Kellerbuch
187		0	0	0	0	0	0	1	
188		0	0	0	1	0	0	1	Microsoft Excel
189		0	0	0	0	0	0	0	
190		0	0	1	0	0	0	1	Microsoft Excel
191		0	0	0	0	0	1	1	Microsoft Excel
192	ja	0	0	0	0	0	0	1	Microsoft Access
193		1	0	0	0	0	0	1	Microsoft Excel
194		0	0	0	0	0	0	1	Microsoft Excel
195		0	0	0	0	0	0	1	
196	ja	0	0	0	0	0	0	1	LBG Kellerbuch
197	Zwischensumme auch für nacherfasste Belege wäre sehr gut (zur Kontrolle bei Verkauf mehrere verschidene Artikel und Preise)	0	0	0	0	0	0	1	LBG Kellerbuch
198		0	0	0	0	0	0	1	Microsoft Excel
199	ja	0	0	0	0	0	0	1	LBG Kellerbuch
200		0	0	0	0	0	0	1	propriatary development
201		0	0	0	0	0	1	1	Microsoft Excel
202		0	0	0	0	0	0	1	LBG Kellerbuch
203		0	0	0	0	0	0	1	Microsoft Excel
204		1	0	1	0	0	0	0	
205	Es könnten immer mehr Features oder Komfortfunktionen (zB eine Anbindung an EMCS für Exporte) eingebaut werden, aber alle Grundfunktionen wie Rückverfolgbarkeit sind sehr gut umgesetzt.	0	0	0	0	0	0	1	DIE Warenwirtschaft
206		0	0	0	0	0	0	1	propriatary development
207		0	0	0	0	0	0	1	Microsoft Excel
208		1	0	0	1	0	0	0	
209		0	1	0	1	0	0	0	
210		0	0	0	0	0	0	1	Microsoft Excel
211		0	0	1	0	0	0	1	Microsoft Excel
212	ja	0	0	0	0	0	0	1	LBG Kellerbuch
213	Nein	0	0	0	0	0	0	1	Kellermanagement (Mauß)
214	nein	0	0	0	0	0	0	0	

#	Question Code								
	1.2.y4	**1.2.n1.a1**	**1.2.n1.a2**	**1.2.n1.a3**	**1.2.n1.a4**	**1.2.n1.a5**	**1.2.n1.a6**	**1.3**	**1.3.y1**
215	bessere grafische Oberfläche. Behandlungsschritte Vergleich zum Vorjahr	0	0	0	0	0	0	1	Orgamax
216		0	0	0	1	0	0	1	Microsoft Excel
217		0	0	0	0	0	0	0	
218	nein	0	0	0	0	0	0	1	LBG MoneyMaker
219		0	0	0	0	0	0	0	
220	Immer	0	0	0	0	0	0	0	
221		0	0	0	0	1	0	0	
222		1	0	0	0	0	0	0	
223		0	0	0	0	0	1	1	LBG MoneyMaker
224		0	0	0	0	1	0	1	Microsoft Excel
225	ja	0	0	0	0	0	0	1	LBG Kellerbuch
226		0	0	0	0	0	0	1	LBG Kellerbuch
227	Ja	0	0	0	0	0	0	1	LBG Registrierkasse
228	Ja	0	0	0	0	0	0	1	
229	ja neuere Version	0	0	0	0	0	0	1	Microsoft Excel
230		0	0	1	0	0	0	0	
231		0	1	0	0	0	0	0	
232	ja	0	0	0	0	0	0	1	Kellermanagement (Mauß)
233		0	0	0	0	0	0	0	

Table A.4: Survey participant answers for questions 1.2.y4 to 1.3.y1

#	Question Code							
	1.4.a1	**1.4.a2**	**1.4.a3**	**1.4.a4**	**1.4.a5**	**1.4.y1**	**1.5**	**1.6**	**1.7**
1	0	0	0	0	0		1	Microsoft Excel or Word	Kellerbuch application
2	1	0	0	0	1	Photoshop marketing, ilustrator marketing , ms Office Programme Marketing und kelleraufzeichnugen	1	Kellerbuch application	Kellerbuch application
3	1	0	0	0	0	Tankkühlung	0	manually written	manually written
4	1	0	0	0	0	Excel	1	Microsoft Excel or Word	Kellerbuch application
5	1	0	0	0	0	Fermentronic AWI Energietechnik Graz	0	Kellerbuch application	Kellerbuch application
6	0	0	0	0	0		1	e-mail app (e.g. Outlook)	e-mail app (e.g. Outlook)
7	0	0	0	0	0		1	Kellerbuch application	manually written
8	1	0	0	0	0	excel	1	Kellerbuch application	Kellerbuch application
9	1	0	0	0	0	Sitt, Tankkühlung und Raumtemperaturüberwachung	1	Kellerbuch application	e-mail app (e.g. Outlook)
10	1	0	1	0	0		1	own database (e.g. Access)	manually written
11	0	0	0	0	1	vitimeteo	1	Kellerbuch application	Kellerbuch application
12	0	0	0	0	0		1	e-mail app (e.g. Outlook)	Kellerbuch application
13	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
14	0	0	0	0	1		1	Microsoft Excel or Word	Microsoft Excel or Word
15	1	1	0	0	1	Excel, Word, LBG, Tankkühlung	1	Kellerbuch application	Kellerbuch application
16	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
17	0	0	0	0	0		1	Microsoft Excel or Word	Microsoft Excel or Word
18	0	0	0	0	0		1	Kellerbuch application	Microsoft Excel or Word
19	1	0	0	0	0	Bussystem zur steuerung der Gärführung (Programm Vininfo) der Firma Sitt	0	others	
20	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
21	0	0	0	0	1	office corel draw photoshop	1	others	Kellerbuch application
22	1	0	0	0	0	Excel	1	Microsoft Excel or Word	I remember this info
23	0	0	0	0	1	Elektronische Steuerung von Arbeitsgeräten am Traktor, Landwirtschaft: LBG	0	e-mail app (e.g. Outlook)	Microsoft Excel or Word
24	0	0	0	0	0		1	e-mail app (e.g. Outlook)	Microsoft Excel or Word
25	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
26	0	0	0	0	0		1	others	Kellerbuch application

#	Question Code								
	1.4.a1	**1.4.a2**	**1.4.a3**	**1.4.a4**	**1.4.a5**	**1.4.y1**	**1.5**	**1.6**	**1.7**
27	1	0	1	0	0		1	e-mail app (e.g. Outlook)	Kellerbuch application
28	1	0	0	0	0	Tankkühlung von SITT	1	e-mail app (e.g. Outlook)	
29	0	0	0	0	1	Kellerbuch Bonierung Hotelprogramm Finazbuchaltung	1	Kellerbuch application	Kellerbuch application
30	1	0	0	0	0	Excel	1	Kellerbuch application	Kellerbuch application
31	1	0	0	0	0	Tankkühlung	1	e-mail app (e.g. Outlook)	e-mail app (e.g. Outlook)
32	1	1	1	1	1	Kellermanagement Kellerbuch	1	CRM application	CRM application
33	1	0	0	0	0		1	Kellerbuch application	Kellerbuch application
34	0	1	0	0	0	Excel	1	own database (e.g. Access)	own database (e.g. Access)
35	1	0	0	0	0	Excel	1	own database (e.g. Access)	Microsoft Excel or Word
36	1	1	0	0	0	Stierschneider Weinformelsammlung	1	e-mail app (e.g. Outlook)	Kellerbuch application
37	0	0	0	0	0		1	Microsoft Excel or Word	Kellerbuch application
38	1	0	0	0	0	Tankkühlung	1	Kellerbuch application	Kellerbuch application
39	1	0	0	0	0	LBG Kellerbuch	1	Kellerbuch application	manually written
40	1	0	0	0	0	von der firma deschka tank und raumkühlung	1	Kellerbuch application	Kellerbuch application
41	0	0	0	0	1	allgemeine Aufzeichnungen (Arbeitszeit, Maschinenzeiten, ...)	1	own database (e.g. Access)	own database (e.g. Access)
42	0	0	0	0	1	Werbung, Marketing, Verkauf - Microsoft Office	0	manually written	manually written
43	1	0	0	0	0	Gärsteuerung SITT	1	Kellerbuch application	Kellerbuch application
44	0	0	0	0	0		1	Microsoft Excel or Word	others
45	0	0	1	1	0	Spritzcontrol für die Feldspritze. Sähmaschinensteuerung.	1	Microsoft Excel or Word	
46	1	0	0	0	0	LBG, Excel	1	Kellerbuch application	Kellerbuch application
47	1	0	0	0	0		1	e-mail app (e.g. Outlook)	e-mail app (e.g. Outlook)
48	0	0	0	0	0		1	Microsoft Excel or Word	Microsoft Excel or Word
49	0	0	1	0	0	GPS System	1	Kellerbuch application	Kellerbuch application
50	1	0	0	0	0	Sitt / Gärsteuerung	1	Kellerbuch application	Kellerbuch application
51	0	0	0	0	0		1	e-mail app (e.g. Outlook)	Kellerbuch application
52	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
53	0	0	0	0	0		0	Microsoft Excel or Word	manually written
54	1	1	0	0	0	selbst gestrickte Excel-Dateien	1	Microsoft Excel or Word	Microsoft Excel or Word
55	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
56	1	0	0	0	0	Tankkühlung, Lagerhaus	1	Kellerbuch application	Kellerbuch application
57	1	0	0	0	0	Weintank-Kühlung - Namen weiss ich leider nicht	0	manually written	manually written
58	1	1	0	0	0	Windows XLS	1	Kellerbuch application	Kellerbuch application
59	0	0	0	0	0		1	Microsoft Excel or Word	manually written
60	0	0	0	0	1	Mails, Word, Excel,Macromedia Dreamweaver	1	Microsoft Excel or Word	Microsoft Excel or Word
61	0	0	0	0	1	Moneymaker, Buchhaltung	1	Kellerbuch application	Kellerbuch application
62	0	0	0	0	0		1	Kellerbuch application	others
63	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
64	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
65	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
66	1	0	0	0	1	LBG BUCHUNGSTOOLS E-MAIL PROGR:	1	Kellerbuch application	Kellerbuch application
67	1	0	0	0	0	WFT VinPilot	1	manually written	I remember this info
68	0	0	0	0	0		1	e-mail app (e.g. Outlook)	manually written
69	1	1	1	0	0	GPS	1	own database (e.g. Access)	own database (e.g. Access)
70	1	0	1	0	1		1	Microsoft Excel or Word	manually written
71	1	0	0	0	1	Exel,Word.	0	Microsoft Excel or Word	Microsoft Excel or Word
72	0	0	0	0	0		1	Microsoft Excel or Word	I remember this info
73	0	0	0	0	0		1	e-mail app (e.g. Outlook)	
74	0	0	1	0	0	Pflanzenschutz im Ackerbau	0	e-mail app (e.g. Outlook)	I remember this info
75	0	0	0	0	0		0	Microsoft Excel or Word	Microsoft Excel or Word
76	0	0	0	0	0		1	Online service	Kellerbuch application
77	0	0	0	0	0		1	e-mail app (e.g. Outlook)	Kellerbuch application
78	1	0	0	0	0		1	Kellerbuch application	I remember this info
79	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application

#	Question Code								
	1.4.a1	1.4.a2	1.4.a3	1.4.a4	1.4.a5	1.4.y1	1.5	1.6	1.7
80	0	0	0	0	0		0	manually written	I remember this info
81	1	0	0	0	0	Gärsteuerung, klimas-teuerung	1	Kellerbuch application	Kellerbuch application
82	1	0	0	0	0	Tankkühlung Vinpilot WFT	1	Kellerbuch application	Kellerbuch application
83	0	0	0	0	0		1	e-mail app (e.g. Outlook)	manually written
84	1	1	0	0	0		1	Microsoft Excel or Word	Microsoft Excel or Word
85	0	0	0	0	0		1	Microsoft Excel or Word	Kellerbuch application
86	1	0	0	0	0	Fermentronic Gärs-teuerung	1	Kellerbuch application	Microsoft Excel or Word
87	1	1	0	0	1		1	Microsoft Excel or Word	Kellerbuch application
88	0	0	0	0	0		1	e-mail app (e.g. Outlook)	
89	0	0	0	0	0		1	others	others
90	0	0	1	1	1	GPS Steuerung Spritze Düngerstreuer	1	manually written	manually written
91	1	0	0	0	0	WFT Gärsteuerung (VinPilot)	1	Kellerbuch application	Kellerbuch application
92	1	1	0	0	0	Exceltabellen, Tankkühl-lung/Heizung	1	CRM application	Kellerbuch application
93	1	0	0	0	0	Tankkühlung	1	Kellerbuch application	Kellerbuch application
94	1	1	0	0	0	Im Keller für die Gärs-teuerung und für die Aufzeichnung der Wein-behandlungen. Den LBG Bodenwächter für die Öpul Aufzeichnung im Weingarten	1	Kellerbuch application	Kellerbuch application
95	1	0	0	0	0	Word, vininfo	1	Microsoft Excel or Word	Microsoft Excel or Word
96	0	0	0	0	0		1	Kellerbuch application	
97	1	1	0	0	1	selbst gebastelte Excel Programme	1	Kellerbuch application	Kellerbuch application
98	1	1	0	0	1	Exel, Word	1	Kellerbuch application	Kellerbuch application
99	0	0	0	0	1	LBG-Moneymaker, Excel: für AMA-Aufzeichnungen	0	manually written	manually written
100	1	0	1	1	0	Müller	1	Microsoft Excel or Word	Kellerbuch application
101	1	0	0	0	1	Tankkühlung. Sitt Buschen-schankbonierung Schnepf	1	Kellerbuch application	Kellerbuch application
102	0	0	0	0	0		0	Microsoft Excel or Word	
103	1	0	0	0	0	Tankkühlung	0	Microsoft Excel or Word	I remember this info
104	1	1	0	0	0	eigene	1	Kellerbuch application	Kellerbuch application
105	1	0	0	0	0		1	Kellerbuch application	Kellerbuch application
106	0	0	0	0	0		1	e-mail app (e.g. Outlook)	I remember this info
107	0	0	0	0	1	Etikettendruck mit Corel Draw	1	Kellerbuch application	Kellerbuch application
108	1	0	0	0	1		1	e-mail app (e.g. Outlook)	Microsoft Excel or Word
109	1	0	0	0	0		1	Kellerbuch application	Kellerbuch application
110	1	0	0	0	0	Gärung / Microsoft word	1	Microsoft Excel or Word	Microsoft Excel or Word
111	1	0	0	0	0	Steuerung einer Tankkühlung	0	manually written	I remember this info
112	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
113	0	1	0	1	0	Ecel	1	e-mail app (e.g. Outlook)	manually written
114	0	0	0	0	0		1	Microsoft Excel or Word	manually written
115	1	0	0	0	0	sitt	1	Kellerbuch application	Kellerbuch application
116	1	0	0	0	0	Gärsteuerung	1	Kellerbuch application	Kellerbuch application
117	1	0	0	0	0	MS-Office-Paket, LBG Kellerbuch	1	Kellerbuch application	Kellerbuch application
118	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
119	1	1	0	0	0	LBG Bodenwächter, Vin Pilot Profi	1	Kellerbuch application	Kellerbuch application
120	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
121	1	0	0	0	0	lbg	1	Kellerbuch application	Kellerbuch application
122	1	0	0	0	0	Gärsteuerung WFT	1	Kellerbuch application	Kellerbuch application
123	0	0	0	0	0		1	Microsoft Excel or Word	Microsoft Excel or Word
124	0	0	0	0	0		1	CRM application	manually written
125	1	0	1	0	0		1	Microsoft Excel or Word	Kellerbuch application
126	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
127	1	0	0	0	0	Temperatursteuerung bei der Gärung	1	Kellerbuch application	Kellerbuch application
128	0	0	0	0	0		1	Microsoft Excel or Word	Microsoft Excel or Word

#	Question Code								
	1.4.a1	**1.4.a2**	**1.4.a3**	**1.4.a4**	**1.4.a5**	**1.4.y1**	**1.5**	**1.6**	**1.7**
129	0	0	0	0	0		1	CRM application	I remember this info
130	1	0	0	0	0		1	Kellerbuch application	Kellerbuch application
131	1	1	0	0	0	Im Keller Excel Im Weingarten Excel und Word	1	Microsoft Excel or Word	CRM application
132	0	0	0	0	1	Sitt Tankheizung	1	e-mail app (e.g. Outlook)	e-mail app (e.g. Outlook)
133	0	0	0	0	1	Tankkühlung	1	Kellerbuch application	Kellerbuch application
134	1	0	0	0	0	Gärsteuerung,Kühlsteuerung	1	e-mail app (e.g. Outlook)	others
135	1	0	0	0	0	Weinbehandlung, Verarbeitung	1	Kellerbuch application	Kellerbuch application
136	1	0	0	0	1	LBG	1	Kellerbuch application	Kellerbuch application
137	1	1	0	0	0	Exel und beim Auspflanzen GIS	1	e-mail app (e.g. Outlook)	manually written
138	1	0	0	0	0	LBG	1	CRM application	CRM application
139	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
140	0	0	0	0	1	Manymaker, LBG-Feldplaner, Bodenwächter, Registrierkassa	1	Kellerbuch application	Kellerbuch application
141	1	1	1	1	1	APYS, Fermentronic, Holder	1	CRM application	CRM application
142	0	0	0	0	0		1		manually written
143	1	0	0	0	1	Gärtemperaturregelung, Buchhaltung, Personalverwaltung, Tageslosung-Tipos	1	own database (e.g. Access)	Kellerbuch application
144	0	0	0	0	0		1	e-mail app (e.g. Outlook)	Microsoft Excel or Word
145	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
146	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
147	0	0	0	0	0		1	CRM application	CRM application
148	1	0	0	0	1	Gärsteuerung	1	e-mail app (e.g. Outlook)	Microsoft Excel or Word
149	1	0	0	0	1		1	Kellerbuch application	Kellerbuch application
150	1	0	0	0	0	Vinpilot	1	Kellerbuch application	Kellerbuch application
151	1	0	0	0	0	Tankkühlung	1	Kellerbuch application	Kellerbuch application
152	0	0	0	0	0		1	Microsoft Excel or Word	Microsoft Excel or Word
153	0	0	0	0	0		1	Microsoft Excel or Word	I remember this info
154	1	1	0	0	0	Microsoft Produkte und SITT Tanksteuerung	1	Kellerbuch application	Kellerbuch application
155	0	0	0	0	0		1	manually written	manually written
156	0	0	0	0	0		1	CRM application	others
157	1	0	0	0	0	LBG Kellerbuch	1	Kellerbuch application	Kellerbuch application
158	0	0	0	0	0		1	manually written	manually written
159	1	0	0	0	0	excel	1	e-mail app (e.g. Outlook)	
160	0	0	0	0	1	Microsoft Word, eigene Homepage, EMAIL	0	manually written	I remember this info
161	0	0	0	0	1	wörd, excel,	0	Microsoft Excel or Word	I remember this info
162	0	0	0	1	0	Amazone Feldspritze und Düngersteuer	0	Microsoft Excel or Word	manually written
163	0	1	0	0	1		0	Kellerbuch application	Kellerbuch application
164	1	0	1	1	0	Am Traktor und auf landwirtschaftlichen Geräten ein selbst entwickeltes, im Keller vinpilot	1	others	others
165	1	0	0	0	0	Vinpilot Fa. WFT	1	e-mail app (e.g. Outlook)	Microsoft Excel or Word
166	0	0	0	0	0		1	e-mail app (e.g. Outlook)	e-mail app (e.g. Outlook)
167	0	0	0	0	0		1	Microsoft Excel or Word	Kellerbuch application
168	1	0	0	0	0		1	Kellerbuch application	Kellerbuch application
169	0	0	0	0	0		1	e-mail app (e.g. Outlook)	manually written
170	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
171	0	0	0	0	1	microsoft office word	1	own database (e.g. Access)	I remember this info
172	0	0	0	0	1	verschiedene anbieter	1	Kellerbuch application	Kellerbuch application
173	0	0	0	0	1		1		
174	1	0	0	0	0	LBG	1	e-mail app (e.g. Outlook)	Kellerbuch application
175	0	0	0	0	1	div. excel Formelberechnungen	1	others	I remember this info
176	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
177	1	1	0	0	0		1	Microsoft Excel or Word	Kellerbuch application
178	0	0	0	0	0		1	e-mail app (e.g. Outlook)	
179	0	0	0	0	1	Marketing, Excel Datenbanken, Word	0	Microsoft Excel or Word	others
180	1	0	0	0	0	Steurung der Kühlgeräte über loxone	1	CRM application	CRM application

#	Question Code								
	1.4.a1	1.4.a2	1.4.a3	1.4.a4	1.4.a5	1.4.y1	1.5	1.6	1.7
181	0	0	0	0	0		1	Kellerbuch application	
182	1	0	0	0	0	LBG	1	Kellerbuch application	Kellerbuch application
183	0	0	0	0	0		0	manually written	Microsoft Excel or Word
184	0	0	0	0	1		1	e-mail app (e.g. Outlook)	manually written
185	1	0	0	0	0	SITT Gärsteuerung	1	Microsoft Excel or Word	
186	0	0	0	0	0		1	Kellerbuch application	I remember this info
187	0	0	0	0	0		1	e-mail app (e.g. Outlook)	manually written
188	0	0	0	0	0		1	e-mail app (e.g. Outlook)	e-mail app (e.g. Outlook)
189	0	0	0	0	0		1	e-mail app (e.g. Outlook)	e-mail app (e.g. Outlook)
190	0	0	0	0	0		0	Microsoft Excel or Word	I remember this info
191	0	0	0	0	0		1	manually written	I remember this info
192	1	0	0	0	0		1	own database (e.g. Access)	Kellerbuch application
193	1	0	1	1	0	Tankkühlung, Display vom Traktor, Füllmachine, Etikettiermaschine, Weingartenspritze, Weinpresse	1	Microsoft Excel or Word	Microsoft Excel or Word
194	0	0	0	0	0		1	e-mail app (e.g. Outlook)	I remember this info
195	1	1	0	0	0		1	Kellerbuch application	
196	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
197	0	0	0	0	0		0	Kellerbuch application	Kellerbuch application
198	0	0	0	0	0		0	Microsoft Excel or Word	manually written
199	0	0	0	0	0		1	Kellerbuch application	I remember this info
200	1	0	1	0	0	sitt kellertechnik	1	Kellerbuch application	Kellerbuch application
201	1	0	0	0	0	SITT zur Tankkühlung	1	Microsoft Excel or Word	I remember this info
202	0	0	1	0	0	Trimble	1	Kellerbuch application	I remember this info
203	0	0	0	0	0		1	Microsoft Excel or Word	I remember this info
204	0	0	1	1	0	Düngerstreuer, Motorsteuerung	0	e-mail app (e.g. Outlook)	I remember this info
205	1	0	0	0	1	DAS Kellerbuch zur Lagerverwaltung, Behandlungen, Behandlungsmittelverwaltung, Hilfsstoffverwaltung, Microsoft Office, SkyDrive u. Dropbox zur Dokumentenverteilung und Synchronisation, ELBA5	1	Kellerbuch application	Kellerbuch application
206	0	0	0	0	0		1	Microsoft Excel or Word	Microsoft Excel or Word
207	0	0	0	0	0		1	Microsoft Excel or Word	manually written
208	1	0	0	0	0	Tankkühlung	1	e-mail app (e.g. Outlook)	I remember this info
209	1	1	0	0	0	Gärsteuerungsprogramm, excel, Internet (Nö-Atlas)	1	Microsoft Excel or Word	manually written
210	0	0	0	0	0		1	own database (e.g. Access)	own database (e.g. Access)
211	0	0	0	0	0		1	e-mail app (e.g. Outlook)	I remember this info
212	1	0	0	0	0	excel, word	1	others	others
213	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
214	0	0	0	0	0		1	e-mail app (e.g. Outlook)	Microsoft Excel or Word
215	1	0	0	0	0	Keller - Vininfo	1	CRM application	Microsoft Excel or Word
216	0	1	0	0	1		1	Microsoft Excel or Word	Microsoft Excel or Word
217	0	0	0	0	0		1	e-mail app (e.g. Outlook)	e-mail app (e.g. Outlook)
218	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
219	0	1	0	0	0		1	Microsoft Excel or Word	I remember this info
220	1	0	0	0	1	Money Maker	1	e-mail app (e.g. Outlook)	Kellerbuch application
221	0	0	0	0	0		1	manually written	Microsoft Excel or Word
222	0	0	0	0	1	Aufzeichnung f. Äcker	1	manually written	manually written
223	0	0	0	0	0		1	others	I remember this info
224	1	0	0	0	0	exel	1	e-mail app (e.g. Outlook)	manually written
225	0	0	0	0	0		1	Kellerbuch application	Kellerbuch application
226	1	1	1	1	0	Acon Wetterstationen, Kühlung der Tanks,	0	Kellerbuch application	Kellerbuch application
227	1	0	0	0	0	Sit Gärsteuerung LBG Kellerbuch Pro	1	Kellerbuch application	Kellerbuch application
228	0	0	0	0	0		1	e-mail app (e.g. Outlook)	Microsoft Excel or Word
229	1	1	0	0	1	exel	1	Microsoft Excel or Word	Microsoft Excel or Word
230	0	0	0	0	1	Tankkühlung	1	e-mail app (e.g. Outlook)	manually written
231	1	0	0	0	0	Exel	1	Microsoft Excel or Word	Microsoft Excel or Word
232	1	0	0	0	0		1	Kellerbuch application	Kellerbuch application
233	0	0	0	0	0		1	Microsoft Excel or Word	

#	Question Code								
	1.4.a1	1.4.a2	1.4.a3	1.4.a4	1.4.a5	1.4.y1	1.5	1.6	1.7

Table A.5: Survey participant answers for questions 1.4.a1 to 1.7

#	Question Code									
	1.8	1.8.y1	1.9	1.10.a1	1.10.a2	1.10.a3	1.10.a4	1.10.a5	1.10.a6	1.10.a7
1	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1
2	1	manually written	Kellerbuch application	1	1	0	1	1	1	1
3	0		manually written	0	0	0	0	0	0	0
4	1	Kellerbuch application	Kellerbuch application	1	0	1	0	1	0	0
5	1	Kellerbuch application	Kellerbuch application	1	1	1	1	0	0	0
6	0		manually written	0	0	0	0	0	0	0
7	0		word processor (e.g. Word)	0	1	0	1	0	0	0
8	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1
9	0		Kellerbuch application	1	1	0	0	1	1	1
10	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	0	0
11	1	others	Kellerbuch application	1	1	0	0	0	0	0
12	0		Kellerbuch application	1	1	0	1	0	0	0
13	0		Kellerbuch application	1	1	0	1	1	0	0
14	1	Microsoft Excel or Word	Microsoft Excel	0	0	0	0	0	0	0
15	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1
16	0		Kellerbuch application	1	1	0	1	1	1	1
17	0		word processor (e.g. Word)	1	0	0	0	1	0	1
18	1	Kellerbuch application	Kellerbuch application	1	0	0	0	0	1	0
19	1	others	word processor (e.g. Word)	1	1	0	0	1	1	1
20	0		Kellerbuch application	1	1	0	1	1	0	0
21	0		Kellerbuch application	1	1	0	1	1	0	0
22	0		manually written	0	1	0	0	1	0	0
23	1	Microsoft Excel or Word	Microsoft Excel	1	1	0	0	1	1	0
24	0		Kellerbuch application	1	1	0	1	1	0	0
25	0		Kellerbuch application	1	0	0	0	1	0	0
26	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	0	1
27	0		Kellerbuch application	1	1	0	0	1	0	0
28	0		manually written	1	0	0	0	0	0	0
29	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1
30	0		Kellerbuch application	1	1	0	1	1	0	0
31	0		manually written	1	1	0	1	1	0	0
32	0		Microsoft Excel	1	1	1	1	1	1	1
33	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1
34	0		Microsoft Excel	1	0	0	0	1	0	0
35	0		Microsoft Excel	1	1	0	0	1	1	1
36	0		Kellerbuch application	0	1	0	0	1	0	0
37	0		Kellerbuch application	1	1	0	0	1	0	0
38	0		Kellerbuch application	1	1	0	1	1	0	0
39	1	I don’t store this info	Kellerbuch application	0	1	0	1	1	0	0
40	0		Kellerbuch application	1	1	1	1	1	1	1
41	0		word processor (e.g. Word)	1	1	0	1	1	1	0
42	0		manually written	0	0	0	0	1	0	0
43	0		Kellerbuch application	1	1	0	1	1	0	0
44	1	others	in a POS system	1	0	1	0	1	0	0
45	0		manually written	0	1	0	0	0	0	0
46	0		Kellerbuch application	1	1	0	0	1	1	0
47	0		Microsoft Excel	0	1	0	0	1	1	0
48	1	Microsoft Excel or Word	Microsoft Excel	1	1	0	0	1	0	0
49	0		Kellerbuch application	1	0	0	1	1	0	0
50	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	0	0
51	0		Kellerbuch application	1	1	0	0	1	0	0
52	0		Kellerbuch application	1	0	0	0	1	0	0
53	0		manually written	0	0	0	0	0	0	0
54	1	Microsoft Excel or Word	word processor (e.g. Word)	1	1	1	1	1	0	1
55	0		Kellerbuch application	1	0	0	0	1	0	0
56	0		Kellerbuch application	1	1	0	1	1	1	1
57	0		manually written	0	0	0	0	1	0	0
58	0		Kellerbuch application	1	1	0	1	1	0	0
59	0		manually written	0	0	0	0	1	0	0
60	0		Kellerbuch application	1	1	0	1	1	0	0
61	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1

#	Question Code									
	1.8	**1.8.y1**	**1.9**	**1.10.a1**	**1.10.a2**	**1.10.a3**	**1.10.a4**	**1.10.a5**	**1.10.a6**	**1.10.a7**
62	0		Kellerbuch application	1	1	0	1	1	0	0
63	0		Kellerbuch application	1	1	1	1	0	1	1
64	0		Kellerbuch application	1	1	0	1	1	1	1
65	0		Kellerbuch application	1	1	0	1	1	0	0
66	0		Kellerbuch application	1	1	0	1	1	1	1
67	1	manually written	manually written	0	0	0	0	1	0	0
68	0		word processor (e.g. Word)	0	0	0	0	1	0	0
69	0		database for invoices (e.g. in Access)	1	0	0	1	0	0	0
70	0		manually written	1	0	0	0	1	1	0
71	1	manually written	Microsoft Excel	1	0	0	1	1	0	0
72	1	manually written	word processor (e.g. Word)	1	0	0	0	1	0	0
73	0		Microsoft Excel	1	0	0	0	1	0	0
74	0		others	0	0	0	0	0	0	0
75	0		manually written	1	0	0	1	0	0	0
76	0		Kellerbuch application	1	0	0	0	1	0	0
77	0		Kellerbuch application	1	1	0	1	1	0	0
78	0		manually written	1	0	0	0	1	0	0
79	0		Kellerbuch application	1	1	0	0	0	1	1
80	1	manually written	word processor (e.g. Word)	0	0	0	0	1	0	0
81	0		Kellerbuch application	1	1	0	1	1	0	0
82	1	Kellerbuch application	Kellerbuch application	1	1	1	0	0	0	0
83	0		manually written	0	0	0	0	0	1	0
84	1	Microsoft Excel or Word	Microsoft Excel	0	0	0	0	1	0	0
85	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	0	0
86	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	0	0
87	0		Kellerbuch application	1	0	0	0	1	0	0
88	0		manually written	0	0	0	1	0	0	0
89	1	others	others	1	1	0	1	1	1	1
90	0		others	0	0	0	0	0	0	0
91	1	Kellerbuch application	Kellerbuch application	1	1	0	1	1	0	0
92	1	Microsoft Excel or Word	Kellerbuch application	1	1	1	1	1	1	1
93	1	Kellerbuch application	Kellerbuch application	1	1	0	0	1	0	0
94	0		Kellerbuch application	1	1	0	1	1	1	1
95	0		word processor (e.g. Word)	1	0	0	0	1	1	1
96	0		Kellerbuch application	1	1	0	0	1	0	0
97	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	0	0
98	0		Kellerbuch application	1	1	0	0	1	1	0
99	0		manually written	0	0	0	0	1	0	0
100	0		Kellerbuch application	0	0	0	0	1	0	0
101	1	Kellerbuch application	Kellerbuch application	1	1	0	1	0	0	1
102	0		Online service	1	1	0	0	0	0	0
103	1	manually written	manually written	0	1	0	1	1	0	0
104	0		Kellerbuch application	1	1	0	1	0	0	0
105	0		Kellerbuch application	1	1	0	1	0	0	0
106	0		Microsoft Excel	1	1	0	0	1	0	0
107	1	Kellerbuch application	Kellerbuch application	1	1	0	0	1	0	0
108	0		Kellerbuch application	1	1	0	1	1	1	0
109	0		Kellerbuch application	1	1	0	1	1	0	1
110	1	manually written	manually written	1	1	0	0	1	0	0
111	0		manually written	0	0	0	0	1	0	0
112	1	Kellerbuch application	Kellerbuch application	1	1	1	1	0	0	0
113	0		manually written	0	0	0	0	1	0	0
114	1	manually written	manually written	1	1	0	1	1	0	0
115	0		Kellerbuch application	1	1	0	0	0	0	0
116	0		Kellerbuch application	1	1	0	1	0	0	0
117	0		Kellerbuch application	1	1	1	1	1	1	1
118	0		Kellerbuch application	1	1	1	1	1	1	1
119	0		Kellerbuch application	1	1	0	0	1	0	1
120	0		Kellerbuch application	1	1	0	1	0	0	0
121	0		Kellerbuch application	1	1	0	0	0	0	1
122	0		Kellerbuch application	1	1	0	1	1	1	1
123	0		Microsoft Excel	1	0	0	0	1	0	0
124	0		manually written	1	0	0	0	0	0	0
125	1		manually written	1	1	0	1	1	0	0
126	0		Kellerbuch application	1	1	0	1	1	0	0
127	0		Kellerbuch application	1	1	0	1	1	1	1
128	0		manually written	1	0	0	0	1	0	0
129	1	I don’t store this info	Kellerbuch application	1	0	0	0	0	0	0
130	0		Kellerbuch application	1	1	0	1	0	0	0
131	1	CRM application	database for invoices (e.g. in Access)	1	1	1	0	1	1	1

#	Question Code									
	1.8	**1.8.y1**	**1.9**	**1.10.a1**	**1.10.a2**	**1.10.a3**	**1.10.a4**	**1.10.a5**	**1.10.a6**	**1.10.a7**
132	1	manually written	Kellerbuch application	0	0	0	0	1	0	0
133	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1
134	1	Microsoft Excel or Word	others	1	1	1	1	1	1	1
135	0		Kellerbuch application	1	1	0	1	1	0	0
136	0		Kellerbuch application	1	1	0	1	1	0	0
137	1	manually written	Kellerbuch application	1	1	0	1	0	0	0
138	0		CRM application	1	1	0	1	1	0	1
139	0		Kellerbuch application	1	1	0	1	1	0	0
140	0		Kellerbuch application	1	0	0	1	1	0	0
141	0		others	1	1	1	1	1	1	1
142	1	manually written	manually written	0	0	0	1	0	0	0
143	1	Microsoft Excel or Word	Kellerbuch application	1	1	0	1	1	0	0
144	1	Microsoft Excel or Word	Microsoft Excel	1	1	0	1	1	0	1
145	1	I don’t store this info	Microsoft Excel	1	1	0	1	1	0	0
146	0		Kellerbuch application	1	1	0	1	1	0	1
147	0		Kellerbuch application	1	1	0	1	1	1	1
148	0		manually written	0	1	0	1	1	1	1
149	0		Kellerbuch application	1	1	0	1	0	0	0
150	0		Kellerbuch application	1	1	0	1	1	1	1
151	0		Kellerbuch application	1	1	0	1	1	1	1
152	0		Microsoft Excel	1	0	0	0	1	1	0
153	0		Microsoft Excel	0	0	0	1	1	0	0
154	0		Kellerbuch application	1	1	0	0	1	1	1
155	0		manually written	1	1	0	0	1	0	1
156	1	others	Microsoft Excel	1	1	0	1	1	1	1
157	0		Kellerbuch application	1	1	0	1	1	0	0
158	0		manually written	0	0	0	0	1	0	0
159	0		in a POS system	1	1	0	1	1	1	1
160	0		manually written	0	0	0	0	1	0	0
161	0		manually written	1	0	0	0	1	1	0
162	0		manually written	1	0	0	0	0	0	0
163	0		Kellerbuch application	1	1	0	0	1	0	0
164	0		others	1	1	0	0	1	1	1
165	0		manually written	1	0	0	1	1	0	0
166	1	Microsoft Excel or Word	word processor (e.g. Word)	0	1	0	0	1	0	0
167	0		Kellerbuch application	1	1	0	0	1	0	0
168	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	0	0
169	0		manually written	1	0	0	0	1	0	0
170	0		Kellerbuch application	1	1	1	1	0	0	0
171	0		own database (e.g. Access)	1	0	0	0	1	0	0
172	0		Kellerbuch application	1	1	0	1	1	1	1
173	0		Microsoft Excel	1	0	0	0	1	0	0
174	0		Kellerbuch application	1	0	0	1	0	0	0
175	0		Kellerbuch application	0	0	0	0	0	0	0
176	0		Kellerbuch application	1	1	0	1	1	1	0
177	0		Kellerbuch application	1	1	1	1	1	1	1
178	0		Kellerbuch application	1	1	0	0	1	0	0
179	0		manually written	1	0	0	0	0	0	0
180	1	CRM application	word processor (e.g. Word)	1	0	0	0	1	0	0
181	0		manually written	1	0	0	1	1	0	0
182	0		Kellerbuch application	1	1	0	1	1	0	1
183	1	manually written	manually written	0	0	0	0	1	0	0
184	0		word processor (e.g. Word)	0	0	0	0	1	0	0
185	0		manually written	1	0	0	0	1	0	0
186	1	I don’t store this info	Kellerbuch application	1	1	0	0	0	0	0
187	0		Microsoft Excel	1	0	0	0	1	0	0
188	0		manually written	1	0	0	0	0	0	0
189	0		Microsoft Excel	1	0	0	0	0	0	0
190	0		word processor (e.g. Word)	0	0	0	0	0	0	0
191	0		manually written	0	1	0	0	0	0	0
192	0		Kellerbuch application	1	1	0	1	1	0	1
193	1	Microsoft Excel or Word	Microsoft Excel	1	1	0	0	1	0	1
194	0		Microsoft Excel	1	0	0	1	1	0	0
195	1	Microsoft Excel or Word	manually written	0	1	0	1	1	0	0
196	1	I don’t store this info	Kellerbuch application	1	1	0	1	1	0	0
197	0		Kellerbuch application	1	1	0	1	1	0	0
198	0		manually written	0	1	0	0	1	0	0
199	0		Kellerbuch application	1	1	0	1	0	0	0
200	0		manually written	1	0	0	1	0	0	0
201	1		manually written	1	0	0	0	1	0	0

#	Question Code											
	1.8	**1.8.y1**	**1.9**	**1.10.a1**	**1.10.a2**	**1.10.a3**	**1.10.a4**	**1.10.a5**	**1.10.a6**	**1.10.a7**		
202	0		word processor (e.g. Word)	1	1	0	1	1	0	0		
203	0		manually written	1	0	0	0	1	0	0		
204	0		manually written	0	0	0	0	1	0	0		
205	0		Kellerbuch application	1	1	1	1	1	1	1		
206	0		Microsoft Excel	1	1	0	1	1	0	0		
207	0		manually written	1	0	0	0	1	0	0		
208	1	manually written	manually written	1	0	0	0	0	0	0		
209	1	manually written	manually written	1	0	0	0	1	0	0		
210	0		word processor (e.g. Word)	1	1	0	0	1	0	0		
211	1	manually written	manually written	0	0	0	0	1	0	0		
212	0		Kellerbuch application	1	1	0	0	1	0	0		
213	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	0		
214	0		Kellerbuch application	1	0	0	0	0	0	0		
215	0		in a POS system	1	1	0	0	1	0	1		
216	1	Microsoft Excel or Word	word processor (e.g. Word)	1	1	0	1	1	1	1		
217	1	manually written	manually written	0	0	0	1	0	0	0		
218	0		Kellerbuch application	1	0	0	1	0	1	1		
219	1	I don't store this info	manually written	1	0	0	0	1	0	0		
220	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	0	0		
221	0		manually written	0	0	0	0	1	0	0		
222	0		manually written	0	0	0	0	1	0	0		
223	0		Microsoft Excel	1	0	0	0	1	0	0		
224	0		manually written	1	0	0	1	1	0	0		
225	0		Kellerbuch application	1	1	0	1	1	0	1		
226	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1		
227	1	Kellerbuch application	Kellerbuch application	1	1	1	1	1	1	1		
228	0		Kellerbuch application	0	1	0	1	0	0	0		
229	1	Microsoft Excel or Word	others	1	0	0	0	1	1	1		
230	1	manually written	manually written	0	0	0	0	1	1	0		
231	0		manually written	1	0	0	0	0	0	0		
232	1	I don't store this info	Kellerbuch application	1	0	0	0	0	0	0		
233	0		manually written	1	0	0	0	0	0	0		

Table A.6: Survey participant answers for questions 1.8 to 1.10.a7

#	Question Code											
	1.10.a8	**1.10.a9**	**1.10.a10**	**1.10.a11**	**1.10.a12**	**1.10.a13**	**1.10.a14**	**1.10.a15**	**1.10.a16**	**1.11.a1**	**1.11.a2**	**1.11.a3**
1	1	1	1	1	0	0	1	1	0	0	0	0
2	1	1	1	1	1	1	1	1	0	1	1	1
3	0	0	0	0	0	0	0	0	0	0	0	0
4	1	1	1	0	0	1	1	0	0	0	0	0
5	0	1	0	0	1	0	1	1	0	0	0	0
6	0	0	0	0	0	0	0	0	0	1	1	0
7	0	1	0	0	0	0	0	0	0	1	0	0
8	1	1	1	1	1	1	1	1	1	0	0	0
9	1	1	1	0	0	0	1	0	0	1	1	0
10	0	1	0	0	1	0	0	1	0	0	0	0
11	0	1	0	0	1	0	0	1	0	0	0	0
12	1	1	1	0	1	0	0	1	0	0	0	0
13	1	1	1	1	1	1	0	1	0	0	0	0
14	1	1	0	0	0	0	0	0	0	1	0	0
15	1	1	1	1	1	1	1	1	0	0	0	0
16	1	1	1	0	0	1	0	0	0	0	0	0
17	1	1	0	0	0	0	0	0	0	0	0	0
18	0	1	1	0	0	0	0	0	0	0	0	0
19	1	1	1	0	0	0	0	0	0	0	0	0
20	1	1	1	0	0	0	0	0	0	1	1	0
21	1	1	1	1	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	1	0	0
23	0	1	0	0	0	0	0	0	0	0	0	0
24	1	1	1	1	1	0	0	0	0	0	0	0
25	1	1	0	0	0	0	0	0	0	0	0	0
26	1	1	1	1	1	1	1	1	0	0	0	0
27	0	1	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	1	1	0

#	Question Code											
	1.10.a8	1.10.a9	1.10.a10	1.10.a11	1.10.a12	1.10.a13	1.10.a14	1.10.a15	1.10.a16	1.11.a1	1.11.a2	1.11.a3
29	1	1	1	0	0	1	0	0	0	0	0	0
30	1	1	1	0	1	0	0	0	0	0	0	0
31	0	1	1	0	0	0	0	0	0	1	1	1
32	1	1	1	1	0	0	0	0	0	1	1	1
33	1	1	1	1	1	1	1	1	0	0	0	0
34	0	1	0	0	0	0	0	0	0	0	0	0
35	0	1	1	0	0	0	0	0	0	0	0	0
36	0	1	1	0	0	0	0	0	0	0	0	0
37	1	1	0	0	1	1	0	0	0	1	1	0
38	0	1	1	0	0	0	0	1	0	0	0	0
39	1	1	1	0	1	0	0	1	0	0	0	0
40	1	1	0	0	1	0	1	0	0	0	0	0
41	1	1	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	1	0	0
43	1	1	0	0	0	0	0	0	0	0	0	0
44	1	1	0	1	1	1	0	0	0	1	1	1
45	0	0	0	0	0	0	0	0	0	1	0	0
46	1	1	1	0	0	0	1	1	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0
48	1	1	1	0	0	0	0	0	0	0	0	0
49	0	1	1	0	0	0	0	1	0	0	0	0
50	0	1	1	0	1	0	0	0	0	0	0	0
51	1	1	1	0	0	0	1	0	0	0	0	0
52	1	1	0	0	0	0	1	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0
54	1	1	1	0	1	0	1	1	0	1	1	1
55	0	1	0	0	0	0	0	0	0	1	1	0
56	1	1	1	1	1	1	1	1	0	0	0	1
57	0	0	0	0	0	0	0	0	0	1	0	0
58	0	1	0	0	1	1	0	1	0	0	0	0
59	0	1	0	0	0	0	0	0	0	0	0	0
60	0	1	1	0	1	0	0	0	0	0	0	0
61	1	1	1	0	0	0	1	1	0	0	0	0
62	1	1	1	0	0	0	0	0	0	0	0	0
63	0	1	1	1	0	0	0	0	0	0	0	0
64	1	1	1	0	1	0	0	1	0	0	0	0
65	1	1	1	0	1	0	1	0	0	0	0	0
66	1	1	1	0	1	0	0	1	0	0	0	0
67	0	0	1	0	0	0	0	0	0	0	0	0
68	0	1	0	0	0	0	0	0	0	1	1	0
69	0	0	0	0	1	0	0	1	0	0	0	0
70	0	0	1	0	0	0	1	0	0	1	1	0
71	0	1	0	0	0	0	0	0	0	0	0	0
72	1	1	1	0	0	0	0	0	0	0	0	0
73	0	1	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	1	0	0
76	0	1	0	0	0	0	0	0	0	0	1	0
77	0	1	1	0	1	0	1	1	0	0	0	0
78	0	0	1	0	0	0	0	0	0	1	0	0
79	1	1	0	0	0	0	1	0	0	0	0	0
80	0	1	1	0	0	0	1	0	0	0	0	0
81	1	1	1	1	1	0	0	0	0	0	0	0
82	0	1	1	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	1	1	0
84	0	1	0	0	1	0	1	0	0	1	1	0
85	1	1	1	1	0	0	0	0	0	0	0	0
86	1	1	1	0	0	0	0	0	0	0	0	0
87	0	1	1	0	1	0	0	1	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0
89	1	1	1	1	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	1	0	0
91	0	1	0	0	1	0	0	1	0	0	0	0
92	1	1	1	1	1	1	1	1	0	0	0	0
93	1	1	0	0	0	0	0	0	0	0	0	0
94	1	1	1	0	0	0	0	1	0	0	0	0
95	1	1	1	0	0	1	0	0	0	0	0	0
96	0	1	0	0	1	0	0	0	0	0	0	0
97	1	1	1	1	0	0	0	0	1	1	1	0
98	1	1	1	0	0	0	0	1	1	1	0	0

#	Question Code											
	1.10.a8	1.10.a9	1.10.a10	1.10.a11	1.10.a12	1.10.a13	1.10.a14	1.10.a15	1.10.a16	1.11.a1	1.11.a2	1.11.a3
99	0	0	0	0	0	0	0	0	0	0	0	0
100	1	1	0	0	1	0	0	1	0	1	0	0
101	1	1	1	0	1	0	0	1	0	0	0	0
102	0	1	0	0	0	0	0	0	0	0	0	0
103	0	0	1	0	0	0	1	1	0	0	0	0
104	0	1	0	0	1	0	0	0	0	1	0	0
105	1	1	1	0	1	0	0	0	1	0	0	0
106	0	1	1	0	0	0	0	0	0	1	1	0
107	1	1	1	0	0	0	1	0	0	0	0	0
108	1	1	1	0	1	0	1	1	0	0	0	0
109	1	1	1	0	0	0	1	1	0	1	1	1
110	0	1	0	0	1	1	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0
112	1	1	1	0	0	0	0	1	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	1	0	0	0	0	0	0	1	1	0
115	1	1	0	0	1	0	0	1	0	0	0	0
116	1	1	0	0	0	0	0	1	0	0	0	0
117	1	1	1	1	0	0	1	1	0	0	0	0
118	1	1	1	0	0	0	1	1	0	0	0	0
119	1	1	1	1	1	0	1	0	0	0	0	0
120	0	1	0	0	1	0	0	0	0	0	0	0
121	1	1	0	0	0	0	0	0	0	1	0	0
122	1	1	1	1	1	1	1	1	0	0	0	0
123	0	1	1	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	1	0	0
125	0	0	0	0	1	0	0	0	0	0	0	0
126	0	1	0	0	1	0	0	1	0	0	0	0
127	1	1	0	1	0	0	1	0	0	0	0	0
128	0	0	0	0	0	0	0	0	0	0	0	0
129	0	1	0	0	0	0	0	0	0	0	0	0
130	0	1	1	0	1	0	0	1	0	0	0	0
131	1	1	1	1	1	0	0	0	0	1	1	1
132	0	0	1	0	0	0	0	0	0	1	1	1
133	1	1	1	1	1	1	1	1	0	0	0	0
134	1	1	1	1	1	1	1	1	0	1	1	1
135	0	1	0	0	0	0	0	0	0	0	0	0
136	1	1	1	1	1	0	0	0	0	0	0	0
137	0	1	0	0	0	0	0	0	0	1	1	1
138	1	1	1	0	1	1	1	0	1	0	0	0
139	1	1	0	1	0	0	1	0	0	0	0	0
140	1	1	1	1	1	0	1	0	0	1	1	0
141	1	1	1	1	0	1	1	1	0	0	0	0
142	0	0	0	0	0	0	0	0	0	1	0	0
143	1	1	1	0	0	0	1	0	0	0	0	0
144	1	1	1	0	1	0	0	0	0	0	0	0
145	0	0	0	0	1	0	0	0	0	0	0	1
146	1	1	0	0	1	0	0	0	0	0	0	0
147	1	1	1	1	0	1	1	1	0	0	0	0
148	1	1	0	0	1	0	1	0	0	0	0	0
149	1	1	1	0	1	0	0	1	0	1	0	0
150	1	1	1	1	1	1	1	1	0	0	0	0
151	1	1	0	0	0	0	1	0	0	1	1	0
152	0	1	0	0	0	0	0	0	0	0	0	0
153	0	1	0	0	0	0	0	0	0	1	1	0
154	1	1	1	0	0	1	1	1	0	0	0	0
155	0	0	1	0	0	0	0	0	0	0	0	0
156	1	1	1	1	1	1	1	0	0	0	0	0
157	0	1	0	0	0	0	0	0	0	0	0	0
158	0	0	0	0	0	0	0	0	0	1	1	0
159	0	1	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	1	1	0	0
161	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	1	1	0
163	0	1	1	0	0	0	1	0	0	0	0	0
164	1	1	1	1	0	0	1	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
166	0	1	1	0	0	0	0	0	0	1	1	0
167	0	0	0	0	1	0	0	0	0	0	0	0
168	1	1	1	1	1	1	0	1	0	0	0	0

#	Question Code											
	1.10.a8	**1.10.a9**	**1.10.a10**	**1.10.a11**	**1.10.a12**	**1.10.a13**	**1.10.a14**	**1.10.a15**	**1.10.a16**	**1.11.a1**	**1.11.a2**	**1.11.a3**
169	0	0	0	0	0	0	0	0	0	1	1	0
170	0	1	0	0	0	0	0	0	0	1	1	1
171	1	1	0	0	0	0	0	0	0	0	1	0
172	1	1	1	0	1	0	0	0	0	0	0	0
173	1	1	0	0	0	0	0	0	0	0	0	0
174	0	1	0	0	0	0	0	0	0	0	0	0
175	0	1	0	0	0	0	0	0	0	0	0	0
176	0	1	1	0	0	0	1	0	0	0	0	0
177	1	1	1	1	1	0	1	1	0	0	0	0
178	0	1	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	1	0	0
180	1	1	1	0	0	0	0	0	0	0	0	0
181	0	0	0	0	0	0	0	0	0	0	0	0
182	0	1	0	0	0	0	0	0	0	0	0	0
183	0	0	1	0	0	0	0	0	0	0	1	0
184	0	0	1	0	0	0	1	0	0	0	0	0
185	0	0	0	0	0	0	0	0	0	0	0	0
186	0	1	0	0	1	0	0	0	0	0	0	0
187	0	1	0	0	0	0	0	0	0	1	0	0
188	0	1	0	0	0	0	0	0	0	0	1	0
189	0	1	0	0	0	0	0	0	0	0	0	0
190	0	1	0	0	0	0	0	0	0	1	0	0
191	0	0	0	0	0	0	0	0	0	0	0	0
192	1	1	1	0	1	1	0	0	0	1	1	0
193	1	1	1	0	0	1	1	0	0	1	0	0
194	1	1	0	0	0	0	1	0	0	1	1	1
195	0	0	0	0	0	0	1	0	0	0	0	0
196	0	1	1	0	1	0	0	0	0	0	0	0
197	0	1	0	0	1	0	0	0	0	0	0	0
198	0	0	0	0	0	0	0	0	0	1	0	0
199	0	1	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0
201	0	0	1	0	0	0	0	0	0	0	0	0
202	0	1	0	0	0	0	0	1	0	0	0	0
203	0	0	0	0	0	0	0	0	0	0	0	0
204	0	0	0	0	0	0	0	0	0	0	0	0
205	1	1	1	1	1	1	1	1	0	1	1	1
206	1	1	0	0	0	0	0	0	0	0	0	0
207	0	0	0	0	0	0	0	0	0	1	1	0
208	0	0	0	0	0	0	0	0	0	1	1	1
209	0	0	0	0	0	1	0	0	1	1	0	0
210	0	1	0	0	0	0	0	0	0	0	0	0
211	0	0	0	0	0	0	0	0	0	1	0	0
212	0	1	1	0	1	0	0	0	0	0	0	0
213	1	1	1	0	1	0	0	1	0	0	0	0
214	0	0	0	0	0	0	0	0	0	0	0	0
215	1	1	1	0	0	0	0	0	0	0	0	0
216	1	1	1	0	0	0	1	0	0	1	1	1
217	0	0	0	0	0	0	0	0	0	0	0	0
218	1	1	1	0	0	0	1	1	0	0	0	0
219	0	0	0	0	0	0	0	0	0	1	1	1
220	0	1	0	0	0	0	0	0	0	0	0	0
221	0	0	0	0	0	0	0	0	0	1	1	0
222	0	0	0	0	0	0	0	0	0	1	1	0
223	0	1	0	0	0	1	0	0	0	0	0	0
224	0	0	0	0	0	0	0	0	0	0	0	0
225	1	1	1	1	0	1	1	1	0	0	0	0
226	1	1	1	1	1	1	1	1	0	0	0	0
227	1	1	1	0	1	0	0	1	1	1	1	1
228	0	1	0	0	0	0	0	0	0	0	0	0
229	0	1	0	0	0	0	0	0	0	0	1	0
230	0	0	0	0	0	0	0	0	0	1	0	0
231	0	0	0	0	0	0	0	0	0	1	0	0
232	0	1	0	0	0	0	0	1	0	0	0	0
233	0	0	0	0	0	0	0	0	0	0	0	0

Table A.7: Survey participant answers for questions 1.10.a8 to 1.11.a3

#	Question Code											
	1.11.a4	**1.11.a5**	**1.11.a6**	**1.11.a7**	**1.11.a8**	**1.11.a9**	**1.11.a10**	**1.11.a11**	**1.11.a12**	**1.11.a13**	**1.11.a14**	**1.11.a15**
1	0	0	0	0	0	0	0	0	0	0	0	0
2	1	1	1	1	1	1	1	1	1	1	1	1
3	0	0	0	0	0	0	0	0	0	0	0	0
4	1	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	1	0	0
6	1	0	0	1	1	1	1	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	1	1	1	1	1	1	1	0	0	0	1	1
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	1	0	0	0	0	1	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	1	0	0	0	1	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	1	1	0	0	0	1	1	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	1	1	0	1	1	1	0	1	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	1	0	0	0	0	1	0	0	0	0	0	0
23	1	0	0	0	0	0	1	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	1	1	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	1	0	0	0	0	0	0	0	0	0
28	0	1	0	0	0	1	0	0	0	0	0	1
29	0	0	0	0	0	0	0	1	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	1	1	1	1	1	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1	1	1	1	1	1
33	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	1	0	0	0	0	0	0	0	0	0
37	1	1	0	0	1	1	0	0	0	1	0	1
38	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	1	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	1	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0
44	1	1	1	1	1	1	1	1	1	1	1	1
45	0	1	0	0	1	1	1	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	1	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	1	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0
54	1	1	0	1	1	1	1	0	1	0	0	1
55	0	0	0	0	0	1	1	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0
58	0	0	1	0	1	0	0	0	0	0	0	0
59	1	1	0	0	1	1	0	0	1	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	0	0	0	0	0
62	0	0	0	1	0	0	0	0	0	1	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	1	1	0	0	0	0	0	0
68	0	0	0	0	0	1	1	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	1	0	1	1	1	0	0	0	0	0

#	Question Code											
	1.11.a4	1.11.a5	1.11.a6	1.11.a7	1.11.a8	1.11.a9	1.11.a10	1.11.a11	1.11.a12	1.11.a13	1.11.a14	1.11.a15
71	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0	0	0	0
75	1	0	1	0	1	1	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	1	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	1	0	0	0	0	0	0	0	0	1
82	0	1	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0
84	1	0	0	0	0	1	1	0	1	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	1	1	0	0	0	0	0	0	0	0
88	1	1	1	0	0	1	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0
90	0	1	0	1	1	1	1	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0
97	1	1	0	0	1	1	1	1	0	0	0	0
98	1	1	1	1	1	1	1	0	1	1	0	1
99	0	0	0	0	0	0	0	0	0	0	0	0
100	1	1	1	0	1	1	0	0	1	0	0	0
101	0	1	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0
104	1	1	0	1	1	1	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
106	1	1	0	0	1	1	1	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0
109	1	1	1	1	1	1	1	1	1	1	1	1
110	0	0	1	0	1	1	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	0	0
113	1	0	0	0	0	1	0	0	0	0	0	0
114	1	1	0	0	1	1	1	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
121	1	1	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	1	1	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0
128	1	0	0	1	1	1	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0
131	0	1	1	1	1	1	1	1	1	0	0	0
132	0	1	0	0	1	1	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0
134	1	1	1	1	1	1	1	1	1	1	1	1
135	0	0	0	0	1	0	0	0	0	0	0	0
136	0	0	0	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	1	0	1	1	0	0
140	1	1	1	1	1	1	1	1	1	0	1	1

#	Question Code											
	1.11.a4	1.11.a5	1.11.a6	1.11.a7	1.11.a8	1.11.a9	1.11.a10	1.11.a11	1.11.a12	1.11.a13	1.11.a14	1.11.a15
141	0	0	0	0	0	0	0	0	0	0	0	0
142	0	1	0	0	0	1	1	0	0	0	1	1
143	0	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	1	0	0	0	0	0	0
146	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	0	0	0	0	0	0	0	0	0
149	0	1	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
151	1	1	1	1	1	1	1	0	0	0	1	0
152	0	0	0	0	0	0	0	0	0	0	0	0
153	1	1	0	0	1	1	0	0	0	0	0	0
154	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	1	0	0	0	0	0	0
156	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0
158	0	0	0	0	1	1	1	1	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	1	0	0	0	0	0	0
161	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	1	1	1	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	1
164	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
166	1	1	0	0	1	1	1	0	0	0	0	0
167	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0
169	1	1	1	1	1	1	1	0	0	0	0	0
170	1	1	0	0	0	1	0	0	0	0	0	0
171	1	0	0	0	0	0	0	0	0	0	1	0
172	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	1	0	0	0	0	0	0
175	0	0	0	0	1	0	0	1	0	0	0	0
176	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	1	0	0	0	0	0
180	1	0	1	0	0	0	0	0	0	0	0	0
181	0	0	0	0	0	0	0	0	0	0	0	0
182	0	0	0	0	0	0	0	0	0	0	0	0
183	0	0	0	0	0	0	0	0	0	0	0	0
184	0	0	0	0	0	0	0	0	0	0	0	0
185	0	0	0	0	0	1	0	0	0	0	0	0
186	0	0	0	0	0	0	0	0	0	0	0	0
187	0	0	0	0	0	0	0	0	0	0	0	0
188	1	0	0	1	0	1	1	0	0	0	0	0
189	0	0	0	0	0	0	0	0	0	0	0	0
190	0	0	0	0	0	1	0	0	0	0	0	0
191	0	0	0	0	0	0	0	0	0	0	0	0
192	1	1	0	1	1	1	1	0	1	1	0	0
193	1	0	0	0	0	1	0	0	0	0	0	0
194	1	1	1	1	1	1	1	0	0	0	1	1
195	0	1	0	0	0	0	0	0	0	0	0	0
196	0	0	0	0	0	0	0	0	0	0	0	0
197	1	0	0	0	0	0	0	0	0	0	0	0
198	0	0	0	0	0	1	1	0	0	0	0	0
199	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0
201	1	0	0	0	0	0	0	0	0	0	0	0
202	0	1	0	0	0	1	0	0	0	0	0	0
203	0	0	0	0	0	1	0	0	0	0	0	0
204	0	0	0	0	0	0	0	0	0	0	0	0
205	1	1	1	1	1	1	1	1	1	1	1	1
206	0	0	0	0	0	0	0	0	0	0	0	0
207	1	1	0	1	0	1	1	0	0	0	0	0
208	1	1	1	1	0	1	0	0	0	0	0	0
209	1	1	0	0	1	1	1	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0

#	Question Code											
	1.11.a4	**1.11.a5**	**1.11.a6**	**1.11.a7**	**1.11.a8**	**1.11.a9**	**1.11.a10**	**1.11.a11**	**1.11.a12**	**1.11.a13**	**1.11.a14**	**1.11.a15**
211	1	1	0	0	1	1	1	1	0	0	0	0
212	0	0	0	0	0	0	0	0	0	0	0	0
213	0	0	0	0	0	0	0	0	0	0	0	0
214	1	0	0	0	0	0	0	0	0	0	0	0
215	1	0	0	0	0	0	0	0	0	0	0	1
216	1	1	1	1	1	1	1	1	1	1	1	1
217	0	0	0	0	0	1	0	0	0	0	0	0
218	0	0	0	0	0	0	0	0	0	0	0	0
219	1	1	1	1	1	1	1	1	1	1	1	1
220	0	0	0	0	0	0	0	0	0	0	0	0
221	0	0	0	0	0	1	0	0	0	0	0	0
222	1	0	0	0	0	0	0	0	0	0	0	0
223	0	0	0	0	0	0	0	0	0	0	0	0
224	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
226	0	0	0	0	0	0	0	0	0	0	0	0
227	1	1	1	1	1	0	1	0	1	0	0	1
228	0	0	0	0	0	0	0	0	0	0	0	0
229	1	0	0	0	0	0	1	0	0	0	0	0
230	1	0	0	0	0	1	0	0	0	0	0	0
231	0	0	0	0	0	0	0	0	0	0	0	0
232	0	0	0	0	0	0	0	0	0	0	0	0
233	0	0	0	0	0	0	0	0	0	0	0	0

Table A.8: Survey participant answers for questions 1.11.a4 to 1.11.a15

#	Question Code									
	2.1	**2.2**	**2.3**	**2.4**	**2.5**	**3.1**	**3.1.n1.a1**	**3.1.n1.a2**	**3.1.n1.a3**	**3.1.n1.a4**
1	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
2	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
3	Help by government office	complicated	no benefit	sceptical	0	0	0	0	0	1
4	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
5	I did it on my own	easy	benefit	sceptical	0	1	0	0	0	0
6	I did it on my own	easy	neutral	secure	1	0	0	0	0	0
7	I did it on my own	complicated	neutral	secure	1	1	0	0	0	0
8	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
9	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
10	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
11	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
12	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
13	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
14	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
15	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
16	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
17	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
18	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
19	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
20	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
21	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
22	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
23	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
24	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
25	I did it on my own	easy	no benefit	misuse of data	1	1	0	0	0	0
26	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
27	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
28	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
29	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
30	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
31	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
32	I did it on my own	complicated	neutral	sceptical	0	1	0	0	0	0
33	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
34	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
35	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
36	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
37	I did it on my own	easy	benefit	secure	1	1	0	0	0	0

#	Question Code									
	2.1	**2.2**	**2.3**	**2.4**	**2.5**	**3.1**	**3.1.n1.a1**	**3.1.n1.a2**	**3.1.n1.a3**	**3.1.n1.a4**
38	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
39	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
40	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
41	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
42	I did it on my own	easy	no benefit	sceptical	0	1	0	0	0	0
43	I did it on my own	easy	neutral	secure	0	1	0	0	0	0
44	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
45	I did it on my own	easy	benefit	secure	1	0	0	0	1	0
46	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
47	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
48	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
49	I did it on my own	easy	benefit	secure	0	1	0	0	0	0
50	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
51	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
52	I did it on my own	easy	no benefit	secure	0	1	0	0	0	0
53	I did it on my own	easy	no benefit	sceptical	0	1	0	0	0	0
54	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
55	I did it on my own	easy	neutral	sceptical	0	1	0	0	0	0
56	I did it on my own	easy	neutral	sceptical	0	1	0	0	0	0
57	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
58	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
59	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
60	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
61	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
62	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
63	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
64	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
65	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
66	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
67	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
68	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
69	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
70	I did it on my own	easy	no benefit	sceptical	1	1	0	0	0	0
71	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
72	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
73	I did it on my own	easy	benefit	secure	1	0	0	1	0	0
74	I did it on my own	easy	benefit	secure	0	1	0	0	0	0
75	Help by government office	complicated	neutral	sceptical	1	1	0	0	0	0
76	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
77	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
78	I did it on my own	easy	neutral	secure	0	1	0	0	0	0
79	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
80	I did it on my own	easy	no benefit	sceptical	0	0	0	0	0	1
81	I did it on my own	complicated	benefit	secure	1	1	0	0	0	0
82	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
83	Help by government office	easy	neutral	secure	1	1	0	0	0	0
84	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
85	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
86	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
87	I did it on my own	complicated	no benefit	sceptical	0	1	0	0	0	0
88	I did it on my own	complicated	neutral	secure	1	1	0	0	0	0
89	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
90	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
91	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
92	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
93	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
94	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
95	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
96	I did it on my own	complicated	no benefit	sceptical	1	1	0	0	0	0
97	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
98	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
99	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
100	I did it on my own	easy	benefit	secure	0	1	0	0	0	0
101	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
102	I did it on my own	complicated	no benefit	secure	1	1	0	0	0	0
103	I did it on my own	easy	benefit	secure	1	0	1	0	0	1
104	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
105	I did it on my own	complicated	benefit	sceptical	0	0	0	0	0	0
106	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
107	I did it on my own	easy	neutral	misuse of data	1	1	0	0	0	0

#	Question Code									
	2.1	**2.2**	**2.3**	**2.4**	**2.5**	**3.1**	**3.1.n1.a1**	**3.1.n1.a2**	**3.1.n1.a3**	**3.1.n1.a4**
108	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
109	I did it on my own	easy	benefit	secure	0	1	0	0	0	0
110	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
111	Help by Family/Friends	easy	neutral	misuse of data	0	1	0	0	0	0
112	I did it on my own	complicated	benefit	secure	1	1	0	0	0	0
113	I did it on my own	complicated	no benefit	misuse of data	0	1	0	0	0	0
114	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
115	I did it on my own	easy	benefit	sceptical	0	1	0	0	0	0
116	I did it on my own	complicated	no benefit	sceptical	0	1	0	0	0	0
117	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
118	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
119	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
120	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
121	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
122	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
123	I did it on my own	easy	benefit	secure	1	0	0	0	0	0
124	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
125	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
126	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
127	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
128	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
129	I did it on my own	easy	neutral	secure	0	1	0	0	0	0
130	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
131	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
132	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
133	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
134	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
135	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
136	I did it on my own	easy	no benefit	sceptical	1	1	0	0	0	0
137	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
138	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
139	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
140	I did it on my own	easy	benefit	secure	0	0	0	0	1	0
141	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
142	I did it on my own	complicated	benefit	sceptical	1	1	0	0	0	0
143	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
144	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
145	I did it on my own	easy	neutral	secure	0	1	0	0	0	0
146	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
147	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
148	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
149	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
150	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
151	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
152	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
153	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
154	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
155	I did it on my own	easy	benefit	sceptical	0	1	0	0	0	0
156	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
157	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
158	I did it on my own	easy	neutral	misuse of data	1	1	0	0	0	0
159	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
160	Help by government office	complicated	no benefit	secure	0	1	0	0	0	0
161	Help by government office	complicated	no benefit	secure	0	1	0	0	0	0
162	I did it on my own	easy	no benefit	sceptical	0	1	0	0	0	0
163	I did it on my own	easy	neutral	sceptical	0	1	0	0	0	0
164	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
165	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
166	I did it on my own	complicated	benefit	secure	1	1	0	0	0	0
167	I did it on my own	easy	benefit	secure	0	1	0	0	0	0
168	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
169	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
170	I did it on my own	complicated	neutral	sceptical	1	1	0	0	0	0
171	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
172	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
173	I did it on my own	easy	neutral	sceptical	0	1	0	0	0	0
174	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
175	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
176	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
177	I did it on my own	easy	benefit	secure	1	1	0	0	0	0

#	Question Code									
	2.1	**2.2**	**2.3**	**2.4**	**2.5**	**3.1**	**3.1.n1.a1**	**3.1.n1.a2**	**3.1.n1.a3**	**3.1.n1.a4**
178	Help by Family/Friends	easy	neutral	sceptical	0	1	0	0	0	0
179	Help by government office	complicated	no benefit	secure	0	1	0	0	0	0
180	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
181	I did it on my own	complicated	neutral	sceptical	0	1	0	0	0	0
182	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
183	I did it on my own	easy	no benefit	sceptical	0	1	0	0	0	0
184	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
185	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
186	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
187	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
188	I did it on my own	easy	benefit	secure	1	0	0	0	0	0
189	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
190	Help by Family/Friends	complicated	no benefit	misuse of data	0	1	0	0	0	0
191	I did it on my own	easy	no benefit	sceptical	0	1	0	0	0	0
192	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
193	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
194	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
195	I did it on my own	complicated	no benefit	sceptical	0	1	0	0	0	0
196	Help by Family/Friends	easy	neutral	sceptical	1	1	0	0	0	0
197	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
198	I did it on my own	easy	neutral	secure	0	1	0	0	0	0
199	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
200	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
201	I did it on my own	easy	no benefit	sceptical	0	1	0	0	0	0
202	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
203	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
204	I did it on my own	complicated	no benefit	sceptical	0	1	0	0	0	0
205	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
206	Help by Family/Friends	easy	benefit	sceptical	1	1	0	0	0	0
207	I did it on my own	easy	benefit	secure	0	1	0	0	0	0
208	I did it on my own	easy	neutral	secure	0	1	0	0	0	0
209	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
210	I did it on my own	easy	benefit	sceptical	0	0	0	1	1	0
211	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
212	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
213	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
214	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
215	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
216	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
217	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
218	I did it on my own	easy	neutral	sceptical	0	1	0	0	0	0
219	I did it on my own	easy	benefit	sceptical	0	1	0	0	0	0
220	I did it on my own	easy	no benefit	misuse of data	0	1	0	0	0	0
221	I did it on my own	easy	benefit	sceptical	1	1	0	0	0	0
222	Help by Family/Friends	complicated	neutral	sceptical	1	1	0	0	0	0
223	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
224	I did it on my own	easy	neutral	sceptical	1	1	0	0	0	0
225	I did it on my own	complicated	neutral	secure	1	1	0	0	0	0
226	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
227	I did it on my own	easy	benefit	secure	1	1	0	0	0	0
228	I did it on my own	easy	no benefit	sceptical	0	1	0	0	0	0
229	I did it on my own	easy	neutral	secure	1	1	0	0	0	0
230	I did it on my own	easy	benefit	secure	1	0	0	1	1	0
231	I did it on my own	complicated	neutral	sceptical	0	0	0	1	0	0
232	I did it on my own	easy	no benefit	sceptical	0	1	0	0	0	0
233	I did it on my own	complicated	no benefit	misuse of data	0	0	0	0	1	0

Table A.9: Survey participant answers for questions 2.1 to 3.1.n1.a4

#	Question Code									
	3.1.n1.a5	**3.1.n1.a6**	**3.2**	**3.2.y1**	**3.3**	**3.3.y1**	**3.3.y2**	**3.3.n1.a1**	**3.3.n1.a2**	**3.3.n1.a3**
1	0	0	1	e-mail app (e.g. Outlook)	0			0	1	0
2	0	0	1	online service (e.g. Mailchimp)	0			0	0	0
3	0	0	0		0			0	0	0
4	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0

#	Question Code									
	3.1.n1.a5	**3.1.n1.a6**	**3.2**	**3.2.y1**	**3.3**	**3.3.y1**	**3.3.y2**	**3.3.n1.a1**	**3.3.n1.a2**	**3.3.n1.a3**
5	0	0	0		0			0	1	0
6	1	0	0		0			0	0	0
7	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
8	0	0	1	via my website	1	customized	Joomla	0	0	0
9	0	0	0		0			0	0	0
10	0	0	1	via my website	1	customized	others	0	0	0
11	0	0	1	e-mail app (e.g. Outlook)	0			0	0	1
12	0	0	0		0			0	0	0
13	0	0	1	via my website	1	standard	Joomla	0	0	0
14	0	0	1		1			0	0	0
15	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
16	0	0	1	via my website	0			0	1	0
17	0	0	0		0			0	1	0
18	0	0	1	e-mail app (e.g. Outlook)	1	standard	Wordpress	0	0	0
19	0	0	1	e-mail app (e.g. Outlook)	0			1	0	0
20	0	0	1	e-mail app (e.g. Outlook)	0			0	1	0
21	0	0	1	via my website	1	customized	I don't know	0	0	0
22	0	0	0		0			0	0	0
23	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
24	0	0	1	online service (e.g. Mailchimp)	1	standard	I don't know	0	0	0
25	0	0	0		0			0	0	0
26	0	0	0		1	customized	Typo3	0	0	0
27	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
28	0	0	1	e-mail app (e.g. Outlook)	0			0	0	1
29	0	0	1	e-mail app (e.g. Outlook)	0			0	1	0
30	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
31	0	0	0		1	customized	I don't know	0	0	0
32	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
33	0	0	1	others	1	customized	I don't know	0	0	0
34	0	0	1	via my website	1	customized	I don't know	0	0	0
35	0	0	1	others	1	customized	I don't know	0	0	0
36	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
37	0	0	1	is done by an ad agency	1	customized	I don't know	0	0	0
38	0	0	1	e-mail app (e.g. Outlook)	0			0	1	0
39	0	0	0		0			0	0	0
40	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
41	0	0	1	others	0			0	1	0
42	0	0	0		0			1	0	1
43	0	0	0		0			0	0	0
44	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
45	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
46	0	0	1	via my website	1	customized	Drupal	0	0	0
47	0	0	1	e-mail app (e.g. Outlook)	1	standard	I don't know	0	0	0
48	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
49	0	0	0		1	standard		0	0	0
50	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
51	0	0	1	online service (e.g. Mailchimp)	0			0	0	0
52	0	0	0		0			0	0	0
53	0	0	0		0			0	0	0
54	0	0	1	via my website	1	customized	I don't know	0	0	0
55	0	0	0		1	customized	I don't know	0	0	0
56	0	0	1	e-mail app (e.g. Outlook)	0			1	0	0
57	0	0	0		0			0	1	0
58	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
59	0	0	0		0			0	0	0
60	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
61	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
62	0	0	0		0			0	0	0
63	0	0	0		0			0	0	0
64	0	0	1	e-mail app (e.g. Outlook)	1	customized		0	0	0
65	0	0	1	e-mail app (e.g. Outlook)	0			0	0	1
66	0	0	0		1	standard	Typo3	0	0	0
67	0	0	1	e-mail app (e.g. Outlook)	1	customized	Wordpress	0	0	0
68	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
69	0	0	1	e-mail app (e.g. Outlook)	1	customized	others	0	0	0
70	0	0	1	e-mail app (e.g. Outlook)	1	I don't know		0	0	0
71	0	0	1	is done by an ad agency	0			1	0	0
72	0	0	0		1	standard	I don't know	0	0	0
73	0	0	0		0			0	0	0
74	0	0	0		0			1	1	0

#	Question Code									
	3.1.n1.a5	**3.1.n1.a6**	**3.2**	**3.2.y1**	**3.3**	**3.3.y1**	**3.3.y2**	**3.3.n1.a1**	**3.3.n1.a2**	**3.3.n1.a3**
75	0	0	0		1			0	0	0
76	0	0	1	via my website	0			0	1	0
77	0	0	0		0			1	0	0
78	0	0	0		1	customized	I don't know	0	0	0
79	0	0	1	via my website	1	customized	Typo3	0	0	0
80	0	0	0		0			0	0	0
81	0	0	0		1	customized	I don't know	0	0	0
82	0	0	0		0			0	1	0
83	0	0	0		0			0	1	0
84	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
85	0	0	1	e-mail app (e.g. Outlook)	1			0	0	0
86	0	0	0		1	customized	I don't know	0	0	0
87	0	0	1	e-mail app (e.g. Outlook)	1	standard	I don't know	0	0	0
88	0	0	0		0			0	0	0
89	0	0	1	online service (e.g. Mailchimp)	1	customized	Joomla	0	0	0
90	0	0	0		1	customized	I don't know	0	0	0
91	0	0	0		0			0	0	1
92	0	0	1	others	1	customized	Joomla	0	0	0
93	0	0	0		0			0	1	0
94	0	0	1	online service (e.g. Mailchimp)	1	customized	Typo3	0	0	0
95	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
96	0	0	0		0			0	0	0
97	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
98	0	0	1	others	1	customized	I don't know	0	0	0
99	0	0	0		0			0	0	1
100	0	0	0		1	standard	I don't know	0	0	0
101	0	0	0		1	customized	I don't know	0	0	0
102	0	0	0		0			1	1	0
103	0	0	0		0			0	0	0
104	0	0	1	e-mail app (e.g. Outlook)	0			0	0	1
105	0	1	0		0			0	0	0
106	0	0	1	e-mail app (e.g. Outlook)	1	standard	I don't know	0	0	0
107	0	0	0		1	standard	I don't know	0	0	0
108	0	0	1	is done by an ad agency	0			0	0	0
109	0	0	0		0			0	1	0
110	0	0	0		0			1	0	0
111	0	0	0		0			0	1	0
112	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
113	0	0	0		0			0	0	1
114	0	0	0		0			0	0	0
115	0	0	1	e-mail app (e.g. Outlook)	0			1	1	0
116	0	0	0		0			0	0	0
117	0	0	0		1	customized	I don't know	0	0	0
118	0	0	1	e-mail app (e.g. Outlook)	0			0	0	1
119	0	0	1	is done by an ad agency	0			0	1	0
120	0	0	0		0			0	1	0
121	0	0	0		0			1	0	0
122	0	0	0		0			0	0	0
123	0	1	0		0			1	0	0
124	0	0	1	is done by an ad agency	0			0	0	0
125	0	0	0		0			1	0	0
126	0	0	0		1	customized	I don't know	0	0	0
127	0	0	0		0			0	0	0
128	0	0	0		0			0	0	0
129	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
130	0	0	1	e-mail app (e.g. Outlook)	1	standard	I don't know	0	0	0
131	0	0	1	e-mail app (e.g. Outlook)	1	customized		0	0	0
132	0	0	0		1	customized	I don't know	0	0	0
133	0	0	1	is done by an ad agency	1	customized	I don't know	0	0	0
134	0	0	1	others	1	customized	Wordpress	0	0	0
135	0	0	0		0			0	1	0
136	0	0	1	via my website	0			1	0	0
137	0	0	1	e-mail app (e.g. Outlook)	0			0	0	1
138	0	0	1	others	0			0	0	0
139	0	0	1	online service (e.g. Mailchimp)	0			0	0	0
140	0	0	0		0			0	0	1
141	0	0	0		1	customized	Typo3	0	0	0
142	0	0	0		1	customized	I don't know	0	0	0
143	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
144	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0

#	Question Code									
	3.1.n1.a5	**3.1.n1.a6**	**3.2**	**3.2.y1**	**3.3**	**3.3.y1**	**3.3.y2**	**3.3.n1.a1**	**3.3.n1.a2**	**3.3.n1.a3**
145	0	0	0		0			1	0	0
146	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
147	0	0	1	online service (e.g. Mailchimp)	1	customized	others	0	0	0
148	0	0	0		0			0	1	0
149	0	0	1	others	0			0	0	0
150	0	0	0		0			0	0	1
151	0	0	0		0			0	0	0
152	0	0	0		0			0	0	0
153	0	0	1	e-mail app (e.g. Outlook)	0			1	0	0
154	0	0	1	others	0			0	0	0
155	0	0	1	via my website	0			1	1	0
156	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
157	0	0	0		0			0	1	0
158	0	0	0		0			1	0	0
159	0	0	1	online service (e.g. Mailchimp)	1	customized	Typo3	0	0	0
160	0	0	0		0			0	1	0
161	0	0	0		0			0	0	1
162	0	0	0		0			0	0	1
163	0	0	1	e-mail app (e.g. Outlook)	1	I don’t know	I don’t know	0	0	0
164	0	0	1	online service (e.g. Mailchimp)	0			0	0	0
165	0	0	1	e-mail app (e.g. Outlook)	1	standard	others	0	0	0
166	0	0	1	e-mail app (e.g. Outlook)	0			0	1	0
167	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
168	0	0	1	others	1	customized	Typo3	0	0	0
169	0	0	0		0			0	0	0
170	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
171	0	0	0		0			0	0	0
172	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don’t know	0	0	0
173	0	0	0		1	I don’t know	I don’t know	0	0	0
174	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
175	0	0	0		0			1	0	0
176	0	0	1	online service (e.g. Mailchimp)	0			1	0	0
177	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don’t know	0	0	0
178	0	0	1	e-mail app (e.g. Outlook)	0			1	0	1
179	0	0	1	e-mail app (e.g. Outlook)	0			1	0	1
180	0	0	1	via my website	0			0	1	0
181	0	0	0		0			0	0	0
182	0	0	1	e-mail app (e.g. Outlook)	1	customized	Joomla	0	0	0
183	0	0	0		0			0	0	1
184	0	0	0		0			0	1	0
185	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
186	0	0	1	e-mail app (e.g. Outlook)	0			1	0	0
187	0	0	1	e-mail app (e.g. Outlook)	0			1	0	0
188	1	0	0		0			0	1	0
189	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
190	0	0	0		1	customized	I don’t know	0	0	0
191	0	0	0		0			0	1	0
192	0	0	0		1	customized		0	0	0
193	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
194	0	0	0		0			0	1	0
195	0	0	0		0			0	0	1
196	0	0	1	others	1	I don’t know	I don’t know	0	0	0
197	0	0	0		0			0	0	0
198	0	0	0		0			0	0	0
199	0	0	0		1	standard	I don’t know	0	0	0
200	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
201	0	0	0		1	customized	I don’t know	0	0	0
202	0	0	1	e-mail app (e.g. Outlook)	0			0	1	0
203	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don’t know	0	0	0
204	0	0	0		0			0	0	0
205	0	0	0		1	customized	Wordpress	0	0	0
206	0	0	0		0			0	0	0
207	0	0	1	e-mail app (e.g. Outlook)	0			0	1	0
208	0	0	1	e-mail app (e.g. Outlook)	1	standard	I don’t know	0	0	0
209	0	0	0		0			1	0	0
210	0	0	0		0			1	0	0
211	0	0	1	e-mail app (e.g. Outlook)	0			1	0	0
212	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don’t know	0	0	0
213	0	0	0		0			0	1	0
214	0	0	1	e-mail app (e.g. Outlook)	1	standard	I don’t know	0	0	0

#	Question Code									
	3.1.n1.a5	**3.1.n1.a6**	**3.2**	**3.2.y1**	**3.3**	**3.3.y1**	**3.3.y2**	**3.3.n1.a1**	**3.3.n1.a2**	**3.3.n1.a3**
215	0	0	1	e-mail app (e.g. Outlook)	0			1	0	0
216	0	0	1	e-mail app (e.g. Outlook)	1	customized	I don't know	0	0	0
217	0	0	0		0			0	0	1
218	0	0	1	via my website	0			0	1	0
219	0	0	0		0			0	0	0
220	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
221	0	0	0		1	customized	I don't know	0	0	0
222	0	0	0		0			1	0	0
223	0	0	1	e-mail app (e.g. Outlook)	1	standard	I don't know	0	0	0
224	0	0	0		0			0	1	0
225	0	0	0		1	I don't know	Wordpress	0	0	0
226	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
227	0	0	1	e-mail app (e.g. Outlook)	1	customized	Typo3	0	0	0
228	0	0	1	e-mail app (e.g. Outlook)	0			0	0	0
229	0	0	1	e-mail app (e.g. Outlook)	0			0	1	0
230	0	0	0		0			0	0	0
231	0	0	0		0			1	0	0
232	0	0	0		0			0	1	0
233	0	0	0		0			0	0	1

Table A.10: Survey participant answers for questions 3.1.n1.a5 to 3.3.n1.a3

#	Question Code												
	3.3.n1.a4	**3.3.n1.a5**	**3.3.n1.a6**	**3.3.n1.a7**	**3.3.n1.a8**	**3.4**	**3.4.y1.a1**	**3.4.y1.a2**	**3.4.y1.a3**	**3.4.y1.a4**	**3.4.y1.a5**	**3.4.y1.a6**	**3.4.y1.a7**
1	0	0	0	0	0	1	0	0	0	1	0	0	0
2	0	0	0	1	0	0	0	0	0	0	0	0	0
3	0	0	0	0	1	0	0	0	0	0	0	0	0
4	0	0	1	0	0	1	0	0	0	0	0	0	1
5	0	1	0	0	0	1	0	0	0	0	0	0	1
6	0	0	0	0	1	0	0	0	0	0	0	0	0
7	0	0	0	0	0	1	1	0	0	0	0	0	0
8	0	0	0	0	0	1	0	1	1	0	0	0	1
9	0	0	1	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	1	1	0	0	0	1	0	1
11	0	1	0	0	0	1	1	0	0	0	0	0	0
12	0	1	0	0	0	1	0	0	0	0	0	0	1
13	0	0	0	0	0	1	1	0	0	0	0	0	0
14	0	0	0	0	0	1	0	1	1	0	0	0	0
15	0	0	1	0	0	1	0	0	0	0	0	1	1
16	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	1	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	1	0	0	0	0	0	0	1
20	0	0	0	0	0	1	1	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	1	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	1	1	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	1	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	1	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	1	0	0	0	0	0	0	1
30	0	1	0	0	0	1	0	0	0	0	1	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	1	1	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	1	0	0	0	0	1	0	0
36	0	0	0	1	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	1	0	0	1	0	0	0	0	0	0	1
40	0	0	0	0	1	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0

#	Question Code												
	3.3.n1.a4	3.3.n1.a5	3.3.n1.a6	3.3.n1.a7	3.3.n1.a8	3.4	3.4.y1.a1	3.4.y1.a2	3.4.y1.a3	3.4.y1.a4	3.4.y1.a5	3.4.y1.a6	3.4.y1.a7
42	0	1	0	0	0	0	0	0	0	0	0	0	0
43	0	1	0	0	0	0	0	0	0	0	0	0	0
44	0	1	0	0	0	0	0	0	0	0	0	0	0
45	0	1	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	1	1	0	1	0	0	0	0
47	0	0	0	0	0	1	1	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	1	0	0	1	0	0	0	1
51	0	0	0	0	0	1	0	0	0	0	0	0	1
52	0	0	1	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	1	1	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0
56	0	1	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0	0
59	0	1	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0
61	0	0	0	0	0	1	0	0	0	0	0	0	0
62	0	1	0	0	0	0	0	0	0	0	0	0	0
63	0	0	1	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0	0
65	0	1	0	0	0	1	1	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	1	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	1	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0	0
74	0	1	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0
76	0	1	0	0	0	0	0	0	0	0	0	0	0
77	0	1	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	1	0	0	1	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	1	0	0	0	1	0	0	0	0	0	0	1
81	0	0	0	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	1	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	1	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	1	1	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	1	0	0	0	0	0	0	0	0
89	0	0	0	0	0	1	1	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0
91	1	1	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	1	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	1	1	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	1	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	1	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	1	0	1	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	1	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	1	1	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0

#	Question Code												
	3.3.n1.a4	3.3.n1.a5	3.3.n1.a6	3.3.n1.a7	3.3.n1.a8	3.4	3.4.y1.a1	3.4.y1.a2	3.4.y1.a3	3.4.y1.a4	3.4.y1.a5	3.4.y1.a6	3.4.y1.a7
112	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	1	0	1	1	0	0	0	1	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0
116	0	1	0	0	0	1	0	0	0	1	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0	0
119	0	1	0	0	0	1	0	0	0	0	0	0	0
120	0	1	0	0	0	0	0	0	0	0	0	0	0
121	0	1	0	0	0	0	0	0	0	0	0	0	0
122	0	1	0	0	0	0	0	0	0	0	0	0	0
123	0	1	0	0	0	0	0	0	0	0	0	0	0
124	0	1	0	0	0	1	0	0	0	0	0	0	1
125	0	1	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0
128	0	0	1	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	1	0	0	0	0	0	0	1
134	0	0	0	0	0	1	0	0	0	0	0	0	1
135	0	0	0	0	0	1	1	0	0	0	0	0	0
136	0	0	0	0	0	1	0	0	0	0	0	0	1
137	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	1	0	0	0	0	0	0	0	0	0	0
139	0	0	0	1	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	1	0	0	0	1	0	0	0	0	0	0	1
144	0	0	0	1	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0
146	0	1	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	1	0	0	0	0	1	0	0
148	0	1	0	0	0	1	0	0	0	0	1	0	0
149	0	0	1	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0
151	0	0	1	0	0	0	0	0	0	0	0	0	0
152	0	0	0	0	1	0	0	0	0	0	0	0	0
153	0	0	0	0	0	1	0	0	0	0	1	0	0
154	0	0	1	0	0	1	0	0	0	0	0	0	1
155	0	1	0	0	0	0	0	0	0	0	0	0	0
156	0	1	0	0	0	1	0	0	0	1	0	0	0
157	0	1	0	0	0	0	0	0	0	0	0	0	0
158	0	0	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	0	0	1	0	0	0	0	0	0	1
160	0	1	0	0	0	0	0	0	0	0	0	0	0
161	0	0	0	0	0	0	0	0	0	0	0	0	0
162	1	1	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0	0
164	0	0	1	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0
166	0	0	0	0	0	0	0	0	0	0	0	0	0
167	0	0	0	1	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0
169	0	1	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	1	0	0	0	0	0	0	0	0
171	0	1	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	1	0	0	0	0	0	0	1
173	0	0	0	0	0	1	1	0	0	0	0	0	0
174	0	1	0	0	0	1	0	0	0	0	0	1	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0
176	0	1	0	0	0	1	1	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	1	0	0	0	0	0	0	0	0
181	0	1	0	0	0	0	0	0	0	0	0	0	0

#	Question Code												
	3.3.n1.a4	3.3.n1.a5	3.3.n1.a6	3.3.n1.a7	3.3.n1.a8	3.4	3.4.y1.a1	3.4.y1.a2	3.4.y1.a3	3.4.y1.a4	3.4.y1.a5	3.4.y1.a6	3.4.y1.a7
182	0	0	0	0	0	0	0	0	0	0	0	0	0
183	0	0	0	0	0	0	0	0	0	0	0	0	0
184	0	0	0	0	0	1	0	0	0	0	1	0	0
185	0	1	0	0	0	0	0	0	0	0	0	0	0
186	0	0	0	0	0	0	0	0	0	0	0	0	0
187	0	0	0	0	0	0	0	0	0	0	0	0	0
188	0	0	0	0	1	0	0	0	0	0	0	0	0
189	0	0	0	0	1	0	0	0	0	0	0	0	0
190	0	0	0	0	0	0	0	0	0	0	0	0	0
191	0	0	0	0	0	0	0	0	0	0	0	0	0
192	0	0	0	0	0	0	0	0	0	0	0	0	0
193	0	0	1	0	0	1	0	0	0	0	0	0	0
194	0	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0	0
196	0	0	0	0	0	1	0	1	0	0	0	0	0
197	0	0	1	0	0	0	0	0	0	0	0	0	0
198	0	0	0	0	0	0	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	1	0	0	0	0	0	0	0	0	0	0	0
201	0	0	0	0	0	1	0	0	0	0	0	0	1
202	0	0	0	0	0	0	0	0	0	0	0	0	0
203	0	0	0	0	0	0	0	0	0	0	0	0	0
204	0	1	0	0	0	0	0	0	0	0	0	0	0
205	0	0	0	0	0	0	0	0	0	0	0	0	0
206	0	0	0	0	0	0	0	0	0	0	0	0	0
207	0	0	0	0	0	0	0	0	0	0	0	0	0
208	0	0	0	0	0	0	0	0	0	0	0	0	0
209	0	1	0	0	0	0	0	0	0	0	0	0	0
210	1	0	0	0	0	0	0	0	0	0	0	0	0
211	0	1	0	0	0	0	0	0	0	0	0	0	0
212	0	0	0	0	0	1	1	0	0	0	0	0	0
213	0	1	0	0	0	0	0	0	0	0	0	0	0
214	0	0	0	0	0	0	0	0	0	0	0	0	0
215	0	0	0	0	0	1	1	0	0	0	0	0	0
216	0	0	0	0	0	1	1	0	0	0	0	0	0
217	0	0	0	0	0	0	0	0	0	0	0	0	0
218	0	0	0	0	0	1	1	0	0	0	0	0	0
219	0	0	0	1	0	1	0	0	0	0	0	0	1
220	0	0	0	0	0	0	0	0	0	0	0	0	0
221	0	0	0	0	0	0	0	0	0	0	0	0	0
222	0	0	0	0	0	0	0	0	0	0	0	0	0
223	0	0	0	0	0	0	0	0	0	0	0	0	0
224	0	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0	0
226	0	1	0	0	0	1	0	0	0	0	0	0	1
227	0	0	0	0	0	0	0	0	0	0	0	0	0
228	0	1	0	0	0	0	0	0	0	0	0	0	0
229	0	1	0	0	0	0	0	0	0	0	0	0	0
230	0	1	0	0	0	0	0	0	0	0	0	0	0
231	0	0	0	0	0	0	0	0	0	0	0	0	0
232	0	0	0	0	0	1	0	0	0	0	0	0	1
233	0	0	0	0	0	0	0	0	0	0	0	0	0

Table A.11: Survey participant answers for questions 3.3.n1.a4 to 3.4.y1.a7

#	Question Code											
	3.4.n1	3.5	3.6	3.7.a1	3.7.a2	3.7.a3	3.7.a4	3.7.a5	3.7.a6	3.7.a7	3.7.a8	3.8.a1
1	-1	1	1	1	1	1	1	1	0	0	0	0
2	1	1	1	1	1	1	1	1	0	0	0	1
3	1	0	0	1	1	0	0	0	0	0	0	0
4	-1	1	1	1	1	1	1	1	0	0	0	0
5	-1	1	1	1	1	0	1	1	0	0	0	0
6	1	0	0	1	1	1	0	0	0	0	0	0
7	-1	1	0	1	1	1	0	1	0	0	0	0
8	-1	1	1	1	1	1	1	1	0	1	0	0

#	Question Code											
	3.4.n1	**3.5**	**3.6**	**3.7.a1**	**3.7.a2**	**3.7.a3**	**3.7.a4**	**3.7.a5**	**3.7.a6**	**3.7.a7**	**3.7.a8**	**3.8.a1**
9	1	1	0	1	0	1	1	1	1	0	0	0
10	-1	1	0	1	1	1	1	1	0	0	0	0
11	-1	1	0	1	1	1	1	1	0	0	0	0
12	-1	1	1	1	1	1	1	1	0	0	0	0
13	-1	1	0	1	1	1	0	1	0	0	0	1
14	-1	1	0	1	1	1	1	1	0	0	0	0
15	-1	1	1	1	1	1	1	1	0	0	0	0
16	1	0	0	1	1	1	1	0	0	0	0	0
17	0	0	0	1	1	0	0	0	0	0	0	0
18	1	1	0	1	0	0	1	1	0	1	0	0
19	-1	1	0	1	1	1	1	0	0	0	0	0
20	-1	1	0	1	1	1	1	1	0	0	0	0
21	1	0	0	1	1	1	0	0	0	0	0	0
22	1	0	0	1	0	0	0	0	0	0	0	0
23	-1	0	0	1	1	1	1	0	0	0	0	0
24	1	1	1	1	1	1	1	1	0	0	0	0
25	1	1	0	1	0	1	1	1	0	0	0	0
26	1	1	1	1	1	1	1	1	0	0	0	0
27	1	0	1	1	1	1	1	0	1	0	0	0
28	0	0	0	1	0	0	0	0	1	0	0	0
29	-1	1	0	1	1	1	1	1	0	0	0	0
30	-1	1	1	1	1	1	1	1	0	0	0	0
31	1	0	0	1	1	1	0	0	0	0	0	0
32	0	0	0	1	0	1	0	0	0	0	0	0
33	-1	1	1	1	1	1	1	1	0	0	0	0
34	0	0	0	1	0	0	0	0	1	0	0	0
35	-1	1	0	1	1	1	1	1	0	0	0	0
36	1	0	0	1	1	1	0	0	1	0	0	0
37	0	1	0	0	1	1	1	0	0	0	0	0
38	1	1	1	1	1	1	1	1	0	0	0	0
39	-1	1	0	1	1	1	1	1	0	0	0	0
40	1	1	1	1	1	1	1	1	0	1	0	0
41	1	0	0	1	0	0	0	0	0	0	0	0
42	1	0	0	1	1	1	0	0	1	0	0	0
43	1	1	0	1	1	1	0	1	0	0	0	0
44	0	1	1	1	1	1	1	1	0	0	0	0
45	1	0	0	1	1	0	0	0	0	0	0	0
46	-1	1	0	1	1	1	1	1	0	0	0	1
47	-1	0	0	1	1	1	1	0	0	0	0	0
48	1	1	0	1	1	1	1	1	0	0	0	0
49	0	0	0	1	1	1	0	0	0	0	0	0
50	-1	1	1	1	1	1	1	1	0	0	0	0
51	-1	1	0	1	1	1	1	1	0	0	0	0
52	1	1	0	1	1	1	0	1	0	0	0	0
53	1	0	0	1	1	0	0	0	0	0	0	0
54	-1	1	0	1	1	1	1	1	0	0	0	0
55	1	1	0	1	1	1	1	1	0	0	0	0
56	1	1	0	1	1	1	1	1	0	0	0	0
57	0	1	0	1	1	1	0	1	0	0	0	0
58	1	1	0	1	1	1	1	1	0	0	0	0
59	1	0	0	1	1	1	1	0	0	0	0	0
60	1	1	0	1	1	1	1	1	0	0	0	0
61	-1	1	0	1	0	1	1	1	0	0	0	0
62	1	1	0	1	1	1	0	1	0	0	0	0
63	1	1	0	1	0	0	1	1	0	0	0	0
64	1	1	0	1	0	1	1	1	0	0	0	0
65	-1	1	0	1	1	1	0	1	1	0	0	0
66	0	0	1	1	1	1	0	0	0	0	0	0
67	1	1	0	0	1	0	0	1	0	0	0	0
68	1	1	1	1	1	1	1	0	0	0	0	0
69	1	0	1	1	0	0	0	0	0	0	0	0
70	0	0	0	1	1	1	0	0	0	0	0	0
71	1	1	0	1	1	1	1	1	0	0	0	0
72	-1	1	0	1	1	1	1	1	0	0	0	0
73	1	0	0	1	1	1	0	0	0	0	0	0
74	0	0	0	1	1	0	0	0	0	0	0	0
75	0	0	0	1	1	1	0	0	0	0	0	0
76	1	1	1	1	1	1	1	1	1	0	0	0
77	1	1	1	1	1	1	1	1	1	0	0	0
78	-1	1	0	1	1	0	0	1	0	0	0	0

#	Question Code											
	3.4.n1	**3.5**	**3.6**	**3.7.a1**	**3.7.a2**	**3.7.a3**	**3.7.a4**	**3.7.a5**	**3.7.a6**	**3.7.a7**	**3.7.a8**	**3.8.a1**
79	1	1	0	1	1	1	1	1	0	0	0	0
80	-1	0	0	1	1	0	1	0	0	0	0	0
81	1	0	0	1	1	1	1	1	0	0	0	0
82	-1	1	0	1	1	1	1	1	0	0	0	0
83	1	0	0	1	1	1	0	0	0	0	0	0
84	-1	1	0	1	1	1	1	1	0	0	0	0
85	1	1	1	1	1	0	1	0	0	0	0	0
86	-1	1	0	1	0	1	1	1	0	0	0	0
87	0	1	1	1	1	1	1	1	1	0	0	0
88	1	0	0	0	0	0	0	0	1	0	0	0
89	-1	1	0	1	1	1	1	1	0	0	0	0
90	1	0	1	1	1	1	0	0	0	0	0	0
91	1	1	0	1	1	1	1	1	0	0	0	0
92	1	1	1	0	0	0	0	0	0	1	0	0
93	1	0	0	1	1	1	0	0	0	0	1	0
94	1	0	0	1	1	1	0	0	0	0	0	0
95	-1	1	0	1	1	1	1	1	0	0	0	1
96	1	0	0	1	1	1	0	0	0	0	0	0
97	1	1	1	1	1	1	1	1	0	0	0	0
98	1	1	1	1	1	1	1	1	0	0	0	0
99	1	0	0	1	1	1	0	1	0	0	0	0
100	0	0	0	1	1	1	0	0	0	0	0	0
101	1	0	0	1	1	1	0	0	0	0	1	0
102	1	0	0	1	1	1	0	0	0	0	0	0
103	1	0	0	1	1	1	0	0	0	0	0	0
104	-1	1	0	1	1	0	0	1	0	0	0	0
105	1	1	0	1	1	0	1	0	0	0	0	0
106	1	1	0	1	1	1	0	0	0	0	0	0
107	0	1	0	1	1	1	1	1	0	0	0	0
108	1	1	1	1	0	1	1	1	0	0	0	0
109	1	1	0	1	1	1	1	1	0	0	0	0
110	-1	1	0	1	1	1	1	1	0	0	0	0
111	0	1	0	1	1	1	1	1	0	0	0	0
112	1	1	0	1	1	1	0	1	0	0	0	0
113	0	0	0	1	1	1	0	0	0	0	0	0
114	-1	1	1	1	1	1	1	1	0	0	0	0
115	0	1	0	1	1	1	1	1	0	0	0	0
116	-1	1	0	1	1	1	1	1	0	0	0	0
117	1	1	1	1	1	1	1	1	0	0	0	0
118	1	0	0	1	1	1	0	0	0	0	0	0
119	-1	1	1	1	1	1	1	1	0	0	0	0
120	1	0	0	1	1	1	1	0	0	0	0	0
121	1	0	0	1	1	1	0	0	0	0	0	0
122	1	1	0	1	1	1	1	1	0	0	0	0
123	1	0	0	1	1	1	0	0	0	0	0	0
124	-1	1	1	1	1	1	1	1	0	0	0	0
125	1	1	0	1	1	1	1	0	0	0	0	0
126	0	0	0	1	1	1	0	0	0	0	0	0
127	1	1	0	1	1	1	1	1	0	0	0	0
128	1	1	0	1	0	0	1	1	0	0	0	0
129	1	1	1	1	1	1	1	1	0	0	0	1
130	1	0	0	1	1	1	1	0	0	0	0	0
131	1	1	0	1	1	1	1	1	0	0	0	0
132	0	1	0	1	1	1	1	1	0	0	0	0
133	-1	1	0	1	1	1	1	1	0	0	0	0
134	-1	1	1	1	1	1	1	1	0	0	0	0
135	-1	1	0	1	1	1	1	1	0	0	0	0
136	-1	1	1	1	0	1	1	1	0	0	0	0
137	1	1	0	1	1	1	1	1	0	0	0	0
138	1	1	0	1	1	1	1	1	0	0	0	1
139	1	1	1	1	1	1	1	1	0	0	0	0
140	0	0	0	1	1	0	0	0	0	0	0	0
141	1	1	0	1	0	1	1	1	0	0	0	0
142	1	1	1	1	1	1	1	1	0	0	0	0
143	-1	1	0	1	1	1	1	1	1	0	0	0
144	1	1	0	1	1	1	1	1	0	0	0	0
145	1	0	0	1	1	1	0	0	0	0	0	0
146	1	0	0	1	1	1	0	0	0	0	0	0
147	-1	1	0	1	0	1	1	1	0	0	0	0
148	-1	0	0	1	1	1	1	0	0	0	0	0

#	Question Code											
	3.4.n1	**3.5**	**3.6**	**3.7.a1**	**3.7.a2**	**3.7.a3**	**3.7.a4**	**3.7.a5**	**3.7.a6**	**3.7.a7**	**3.7.a8**	**3.8.a1**
149	1	1	0	1	1	1	0	0	0	0	0	1
150	1	1	0	1	1	1	1	1	0	0	0	0
151	1	1	0	1	1	1	1	1	0	1	0	0
152	1	1	0	1	1	1	1	1	1	0	0	0
153	-1	0	0	1	1	1	1	0	0	0	0	0
154	-1	1	0	1	1	1	1	1	0	0	0	0
155	0	1	0	1	1	1	1	1	0	0	0	0
156	-1	1	0	1	1	1	1	1	0	0	0	0
157	1	0	0	1	1	0	0	0	0	0	0	0
158	1	1	0	1	1	1	1	1	0	0	0	0
159	-1	1	0	1	1	1	0	1	0	0	0	1
160	1	0	0	1	1	1	0	0	0	0	0	0
161	1	0	0	1	1	1	0	0	0	0	0	0
162	1	0	0	1	1	1	1	0	0	0	0	0
163	1	1	0	1	1	1	1	1	0	0	0	0
164	1	1	0	1	0	1	1	1	0	0	0	0
165	0	0	0	1	1	0	1	0	0	0	0	0
166	1	1	0	1	1	1	1	0	0	0	0	0
167	1	1	0	1	1	1	1	1	0	0	0	0
168	1	1	1	1	1	1	1	1	0	0	0	0
169	1	0	0	1	1	1	0	0	0	0	0	0
170	1	1	0	1	1	1	1	1	0	0	0	0
171	0	0	0	1	1	1	0	0	1	0	0	0
172	-1	1	1	1	0	1	1	1	0	0	0	0
173	-1	1	1	1	1	1	1	1	0	0	0	0
174	-1	1	1	1	0	1	1	1	0	0	0	0
175	1	0	0	1	1	1	0	0	0	0	0	0
176	-1	0	0	1	1	1	1	0	0	0	0	0
177	1	0	0	1	1	1	0	0	0	0	0	0
178	0	1	0	1	1	1	1	1	0	0	0	0
179	1	0	0	1	1	1	1	0	0	0	0	0
180	1	1	0	1	1	1	1	1	1	0	0	0
181	1	0	0	1	1	1	0	0	0	0	0	0
182	1	0	0	1	1	1	0	0	0	0	0	0
183	0	1	0	1	1	1	0	1	0	0	0	0
184	-1	0	0	1	1	1	0	0	0	0	0	0
185	1	0	0	1	0	0	0	0	1	0	0	0
186	1	0	0	1	1	1	1	1	0	0	0	0
187	1	0	0	1	1	1	0	0	0	0	0	0
188	1	0	0	1	1	0	0	0	0	0	0	0
189	1	0	0	1	1	0	0	0	0	0	0	0
190	1	0	0	1	1	0	0	0	0	0	0	0
191	1	0	0	1	1	0	0	0	0	0	1	0
192	1	0	0	1	1	1	0	0	0	0	0	0
193	-1	1	0	1	1	1	1	1	0	0	0	0
194	1	1	0	1	1	1	1	1	0	0	0	0
195	0	0	0	1	1	1	0	0	0	0	0	0
196	-1	1	0	1	1	1	1	0	0	0	0	0
197	0	1	0	1	1	1	0	1	0	0	0	0
198	1	1	0	1	1	1	1	1	0	0	0	0
199	0	0	0	1	1	1	0	0	0	0	0	0
200	1	0	0	1	1	1	0	0	0	0	0	0
201	-1	1	0	1	1	1	1	1	0	0	0	0
202	1	0	0	1	0	0	0	0	0	0	0	0
203	1	0	0	1	1	0	0	0	0	0	0	0
204	1	0	0	1	1	0	0	0	0	0	0	0
205	1	1	1	1	0	1	1	1	0	0	0	0
206	1	1	0	1	1	1	1	1	0	0	0	0
207	1	0	0	1	1	1	0	0	0	0	0	0
208	0	1	0	1	1	1	0	1	0	0	0	0
209	1	1	1	1	1	1	1	1	0	0	0	0
210	0	0	0	1	1	0	0	0	0	0	0	0
211	1	1	0	1	1	1	1	1	0	0	0	0
212	-1	1	0	1	1	1	1	1	0	0	0	0
213	1	0	0	1	1	1	0	0	0	0	0	0
214	1	1	0	1	1	1	1	1	0	0	0	0
215	-1	1	0	1	1	1	1	1	0	0	0	0
216	-1	1	0	1	1	1	1	1	0	0	0	1
217	0	0	0	1	1	1	0	0	0	0	0	0
218	-1	1	1	1	0	1	0	1	0	0	0	0

#	Question Code											
	3.4.n1	**3.5**	**3.6**	**3.7.a1**	**3.7.a2**	**3.7.a3**	**3.7.a4**	**3.7.a5**	**3.7.a6**	**3.7.a7**	**3.7.a8**	**3.8.a1**
219	-1	1	0	1	1	1	1	1	0	0	0	0
220	1	1	0	1	1	1	1	1	0	0	0	0
221	1	0	0	1	1	1	0	0	0	0	0	0
222	0	0	0	1	1	1	0	0	0	0	0	0
223	1	1	0	1	1	1	0	0	0	0	0	0
224	1	0	0	1	1	1	0	0	0	0	0	0
225	0	1	1	1	1	1	1	1	0	0	0	0
226	-1	1	1	1	1	1	1	1	0	0	0	0
227	1	1	0	1	1	1	1	1	0	0	0	1
228	1	1	0	1	1	1	1	1	0	0	0	0
229	1	1	0	1	1	1	0	1	0	0	0	0
230	1	0	0	1	1	1	0	0	0	0	0	0
231	1	0	0	0	1	0	0	0	0	0	0	0
232	-1	1	1	1	1	1	1	1	0	0	0	1
233	1	0	0	1	0	0	0	0	0	0	0	0

Table A.12: Survey participant answers for questions 3.4.n1 to 3.8.a1

#	Question Code											
	3.8.a2	**3.8.a3**	**3.8.a4**	**3.8.a5**	**3.8.a6**	**3.8.a7**	**3.8.a8**	**3.9**	**3.10.a1**	**3.10.a2**	**3.10.a3**	**3.10.a4**
1	1	0	0	1	0	0	0	> 11 times	1	0	0	0
2	1	0	0	0	0	0	0	> 11 times	1	1	1	1
3	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
4	1	0	0	0	0	0	0	4 - 7 times	0	0	0	1
5	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
6	0	0	0	0	0	0	0	8 - 10 times	1	1	0	1
7	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
8	1	0	0	0	0	0	0	> 11 times	1	1	1	1
9	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
10	1	0	0	0	0	0	0	8 - 10 times	1	1	1	1
11	1	0	0	0	0	1	0	4 - 7 times	0	1	0	1
12	1	0	0	0	0	1	0	1 - 3 times	1	0	1	0
13	1	0	0	0	0	1	0	> 11 times	0	0	0	0
14	0	0	0	0	0	0	0	4 - 7 times	0	0	1	1
15	1	0	0	0	0	0	0	8 - 10 times	0	0	0	0
16	0	0	0	0	0	0	0	1 - 3 times	0	0	0	1
17	0	0	0	0	0	1	0	1 - 3 times	0	1	0	0
18	0	0	0	0	0	0	0	4 - 7 times	0	1	0	0
19	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
20	1	1	0	0	0	0	0	1 - 3 times	1	0	1	1
21	1	0	0	0	0	0	0	1 - 3 times	1	1	0	1
22	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
23	1	0	0	0	0	0	0	> 11 times	0	0	0	0
24	1	0	0	0	0	0	0	8 - 10 times	0	1	0	0
25	1	0	0	0	0	0	0	4 - 7 times	1	0	0	0
26	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
27	1	0	0	0	0	0	0	4 - 7 times	1	1	1	1
28	1	0	0	0	0	0	0	1 - 3 times	0	1	0	0
29	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
30	1	0	0	0	0	0	0	4 - 7 times	0	0	1	0
31	0	1	0	0	0	0	0	4 - 7 times	1	0	0	0
32	1	0	0	0	0	0	0		1	0	0	0
33	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
34	1	0	0	0	0	0	0	never	0	0	0	0
35	1	0	0	0	0	1	0	4 - 7 times	0	0	0	0
36	1	1	0	0	0	0	0	1 - 3 times	1	1	0	0
37	0	0	0	0	0	0	0	4 - 7 times	1	0	0	0
38	0	0	0	0	0	0	0	4 - 7 times	0	0	1	0
39	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
40	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
41	1	0	0	0	0	0	0	1 - 3 times	1	1	0	0
42	0	0	0	0	0	0	0		1	0	0	0
43	0	0	0	0	0	0	0	4 - 7 times	1	0	0	0
44	1	0	0	0	0	0	0	8 - 10 times	0	1	1	0
45	0	0	0	0	0	0	0	4 - 7 times	1	0	0	0

#	Question Code											
	3.8.a2	**3.8.a3**	**3.8.a4**	**3.8.a5**	**3.8.a6**	**3.8.a7**	**3.8.a8**	**3.9**	**3.10.a1**	**3.10.a2**	**3.10.a3**	**3.10.a4**
46	1	1	0	0	0	0	0	4 - 7 times	1	1	1	1
47	1	0	0	0	0	0	0	8 - 10 times	0	0	0	0
48	1	0	0	1	0	0	0	8 - 10 times	1	1	0	0
49	1	0	0	0	0	0	0	8 - 10 times	0	1	0	0
50	1	0	0	0	0	0	0	1 - 3 times	1	1	1	1
51	1	0	0	0	0	0	0	> 11 times	0	0	0	0
52	0	0	0	0	0	0	0		0	0	0	0
53	0	0	0	0	0	0	0	never	0	0	0	0
54	0	0	0	0	0	0	0	1 - 3 times	1	1	1	1
55	0	0	0	0	0	0	0	8 - 10 times	1	1	0	0
56	1	0	0	1	0	0	0	4 - 7 times	1	0	0	0
57	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
58	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
59	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
60	0	0	0	0	0	0	0	4 - 7 times	1	1	1	0
61	0	0	0	0	0	0	0	1 - 3 times	1	0	0	0
62	0	0	0	0	0	0	0	8 - 10 times	0	1	0	0
63	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
64	1	0	0	0	0	0	0	> 11 times	0	0	0	0
65	0	0	0	0	0	0	0	4 - 7 times	0	1	0	0
66	1	1	0	0	0	0	0	4 - 7 times	0	1	0	0
67	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
68	1	0	0	0	0	0	0	4 - 7 times	0	1	1	0
69	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
70	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
71	1	1	0	0	0	0	0	4 - 7 times	0	1	0	0
72	0	0	0	0	0	0	0	1 - 3 times	1	1	0	0
73	0	0	0	0	0	0	1	1 - 3 times	0	0	0	0
74	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
75	0	0	0	0	0	0	0		0	0	0	0
76	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
77	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
78	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
79	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
80	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
81	1	0	0	0	0	0	0	4 - 7 times	0	0	1	0
82	0	0	0	0	0	0	0	1 - 3 times	1	0	0	0
83	1	0	0	0	0	0	0	1 - 3 times	1	1	0	0
84	0	0	0	0	0	0	0	1 - 3 times	0	1	0	0
85	0	0	0	0	0	0	0		0	0	0	0
86	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
87	1	0	0	0	0	0	0	4 - 7 times	0	0	0	1
88	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
89	1	1	0	0	0	0	0	4 - 7 times	0	0	0	0
90	0	0	0	0	0	0	0	1 - 3 times	1	1	0	0
91	1	0	0	0	0	0	0	4 - 7 times	1	0	0	0
92	1	0	0	0	0	0	0	4 - 7 times	1	1	1	1
93	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
94	1	0	0	0	0	0	0	8 - 10 times	1	1	0	1
95	1	1	0	0	0	0	0	4 - 7 times	0	0	1	0
96	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
97	0	0	0	0	0	0	0	8 - 10 times	0	0	0	0
98	0	0	0	0	0	0	0	> 11 times	0	1	0	0
99	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
100	0	0	0	0	0	0	0	4 - 7 times	0	0	0	1
101	1	0	0	0	0	0	0	1 - 3 times	0	0	0	1
102	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
103	0	0	0	0	0	0	0	4 - 7 times	0	1	0	0
104	1	0	0	0	0	0	0	4 - 7 times	1	1	0	0
105	0	0	0	0	0	0	0		1	0	0	0
106	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
107	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
108	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
109	0	1	0	0	0	0	0	> 11 times	0	1	0	0
110	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
111	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
112	0	0	0	0	0	0	0	1 - 3 times	0	0	1	0
113	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
114	0	0	0	0	0	1	0	1 - 3 times	0	1	0	0
115	1	0	0	0	0	0	0	8 - 10 times	0	0	1	1

#	Question Code											
	3.8.a2	**3.8.a3**	**3.8.a4**	**3.8.a5**	**3.8.a6**	**3.8.a7**	**3.8.a8**	**3.9**	**3.10.a1**	**3.10.a2**	**3.10.a3**	**3.10.a4**
116	1	0	0	0	0	0	0	8 - 10 times	0	0	0	1
117	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
118	0	0	0	0	0	0	0	> 11 times	0	1	0	0
119	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
120	0	0	0	0	0	0	0	never	1	0	0	0
121	0	0	0	0	0	0	0	4 - 7 times	1	0	0	0
122	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
123	0	0	0	0	0	0	0	4 - 7 times	1	0	0	0
124	0	0	0	0	0	0	0	8 - 10 times	1	0	0	0
125	0	0	0	0	0	0	0	1 - 3 times	1	0	0	0
126	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
127	0	0	0	0	0	0	0	4 - 7 times	0	0	1	1
128	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
129	1	1	0	0	0	0	0	8 - 10 times	1	1	0	1
130	1	0	0	0	0	0	0	4 - 7 times	1	1	0	0
131	1	0	0	0	0	0	0	4 - 7 times	1	0	1	0
132	1	0	0	0	0	0	0	4 - 7 times	1	1	0	1
133	1	0	0	0	0	0	0	8 - 10 times	0	1	0	0
134	1	1	0	0	0	0	0	8 - 10 times	0	0	0	0
135	0	0	0	0	0	0	0	1 - 3 times	0	1	0	0
136	1	0	0	0	0	0	0	> 11 times	0	1	0	0
137	0	0	0	0	0	0	0	4 - 7 times	0	1	0	0
138	1	0	1	0	0	0	1		0	0	0	0
139	1	0	0	1	0	1	0	> 11 times	0	1	0	0
140	0	0	0	0	0	0	0		0	0	0	0
141	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
142	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
143	1	1	0	0	0	0	1	4 - 7 times	0	1	0	0
144	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
145	0	0	0	0	0	0	0	4 - 7 times	0	1	1	0
146	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
147	1	1	0	0	0	0	0	1 - 3 times	0	0	0	0
148	0	0	0	0	0	0	0	4 - 7 times	1	1	1	1
149	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
150	0	0	0	0	0	0	0	4 - 7 times	0	1	0	0
151	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
152	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
153	1	0	0	0	0	0	0	8 - 10 times	1	0	0	0
154	1	0	0	0	0	0	0		0	0	0	0
155	0	1	0	0	0	0	0	1 - 3 times	0	0	0	0
156	1	0	0	0	0	1	0	4 - 7 times	0	0	0	0
157	0	0	0	0	0	0	0	1 - 3 times	1	1	0	0
158	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
159	1	1	0	0	0	0	0	never	0	0	0	0
160	0	0	0	0	0	0	0		0	0	0	0
161	0	0	0	0	0	0	0	8 - 10 times	0	0	0	0
162	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
163	1	0	0	1	0	0	0	4 - 7 times	0	0	1	0
164	1	0	0	0	0	1	0		1	1	0	1
165	1	0	0	0	0	0	0	1 - 3 times	1	0	0	1
166	1	0	0	0	0	0	0	4 - 7 times	0	1	1	0
167	1	0	0	1	0	0	0	4 - 7 times	0	1	0	0
168	1	0	1	0	0	0	0	8 - 10 times	0	0	0	1
169	1	0	0	0	0	0	0	8 - 10 times	0	1	0	1
170	0	0	0	0	0	0	0	4 - 7 times	1	0	0	0
171	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
172	1	0	0	0	0	0	0		0	0	0	0
173	0	0	0	0	0	0	0	4 - 7 times	0	0	1	0
174	1	0	0	0	0	1	0	4 - 7 times	0	0	0	1
175	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
176	0	0	0	0	0	0	0	4 - 7 times	0	1	0	0
177	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
178	1	0	0	0	0	0	0	1 - 3 times	0	1	0	0
179	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
180	1	0	0	0	0	0	0	> 11 times	0	0	0	0
181	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
182	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
183	0	0	0	0	0	0	0	8 - 10 times	1	0	0	0
184	0	0	0	0	0	0	0	1 - 3 times	0	1	0	0
185	1	0	0	0	0	0	0	1 - 3 times	1	0	0	1

#	Question Code											
	3.8.a2	**3.8.a3**	**3.8.a4**	**3.8.a5**	**3.8.a6**	**3.8.a7**	**3.8.a8**	**3.9**	**3.10.a1**	**3.10.a2**	**3.10.a3**	**3.10.a4**
186	0	0	0	0	0	0	0	1 - 3 times	0	1	1	1
187	0	0	0	0	0	0	0	1 - 3 times	0	0	0	1
188	0	0	0	0	0	0	0	8 - 10 times	1	0	1	0
189	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
190	1	0	0	0	0	0	0	8 - 10 times	0	1	0	0
191	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
192	0	1	0	0	0	0	0	1 - 3 times	1	1	1	0
193	1	0	0	0	0	0	0	1 - 3 times	0	1	0	0
194	0	0	0	0	0	0	0	4 - 7 times	0	1	1	1
195	0	0	0	0	0	0	0		0	0	0	0
196	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
197	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
198	1	0	0	0	0	0	0	4 - 7 times	0	0	0	0
199	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
200	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0
201	1	0	0	0	0	0	0	1 - 3 times	1	1	0	1
202	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
203	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
204	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
205	0	0	0	0	0	0	0	4 - 7 times	0	1	1	1
206	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
207	0	0	0	0	0	0	0	4 - 7 times	1	0	1	0
208	0	0	0	0	0	0	0	4 - 7 times	0	1	0	1
209	1	0	0	0	0	0	0	4 - 7 times	0	0	0	1
210	0	0	0	0	0	1	0	4 - 7 times	1	0	0	0
211	1	0	0	0	0	0	0	1 - 3 times	0	1	0	0
212	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
213	0	0	0	0	0	0	0	1 - 3 times	0	1	0	0
214	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
215	1	0	0	0	0	0	0	8 - 10 times	0	1	0	1
216	1	1	1	1	0	0	0	4 - 7 times	1	1	0	1
217	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
218	1	0	0	0	0	0	0	4 - 7 times	0	1	0	0
219	1	0	0	0	0	0	0		0	1	0	0
220	1	0	0	0	0	0	0	8 - 10 times	0	0	0	0
221	0	1	0	0	0	0	0	1 - 3 times	1	1	0	1
222	0	0	0	0	0	0	0		0	0	0	0
223	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
224	0	0	0	0	0	0	0	1 - 3 times	0	0	0	0
225	1	0	0	0	0	0	0	> 11 times	0	0	0	0
226	0	0	0	0	0	0	0	1 - 3 times	0	1	0	0
227	1	1	0	0	0	0	0	8 - 10 times	0	0	1	0
228	1	0	0	0	0	0	0	1 - 3 times	0	0	0	0
229	0	0	0	1	0	0	0	4 - 7 times	0	0	0	1
230	0	0	0	0	0	0	0	8 - 10 times	1	1	0	1
231	0	1	0	0	0	0	0	4 - 7 times	1	0	0	0
232	1	0	0	0	0	0	0	4 - 7 times	0	0	0	1
233	0	0	0	0	0	0	0	4 - 7 times	0	0	0	0

Table A.13: Survey participant answers for questions 3.8.a2 to 3.10.a4

#	Question Code				
	4.1.a1	**4.1.a2**	**4.1.a3**	**4.1.a4**	**4.1.a5**
1	fully applies	fully applies	does rather not apply	fully applies	fully applies
2	does not apply	does not apply	does not apply	does not apply	does not apply
3	does not apply	does not apply	does not apply	does not apply	does not apply
4	fully applies	fully applies	does rather not apply	fully applies	largely applies
5	partially applies	does not apply	does rather not apply	does rather not apply	largely applies
6	largely applies	largely applies	largely applies	largely applies	largely applies
7	fully applies	partially applies	partially applies	partially applies	does rather not apply
8	fully applies	fully applies	fully applies	fully applies	fully applies
9	fully applies	fully applies	fully applies	fully applies	fully applies
10	fully applies	fully applies	fully applies	fully applies	fully applies
11	does rather not apply	does rather not apply	does rather not apply	does rather not apply	partially applies
12	fully applies	largely applies	partially applies	largely applies	largely applies

#	Question Code				
	4.1.a1	**4.1.a2**	**4.1.a3**	**4.1.a4**	**4.1.a5**
13	fully applies	fully applies	largely applies	fully applies	fully applies
14	partially applies	partially applies	partially applies	largely applies	largely applies
15	fully applies	fully applies	fully applies	fully applies	fully applies
16	fully applies	fully applies	fully applies	fully applies	fully applies
17	largely applies	fully applies	largely applies	largely applies	does rather not apply
18	fully applies	fully applies	fully applies	largely applies	partially applies
19	fully applies	largely applies	does rather not apply	largely applies	fully applies
20	fully applies	fully applies	largely applies	fully applies	fully applies
21	fully applies	fully applies	does rather not apply	partially applies	fully applies
22	partially applies	partially applies	does not apply	does not apply	does not apply
23	partially applies	does rather not apply	does rather not apply	fully applies	largely applies
24	fully applies	fully applies	fully applies	fully applies	fully applies
25	fully applies	fully applies	fully applies	fully applies	does not apply
26	fully applies	fully applies	fully applies	fully applies	fully applies
27	fully applies	fully applies	largely applies	fully applies	partially applies
28	largely applies	fully applies	fully applies	partially applies	does rather not apply
29	does not apply	fully applies	fully applies	fully applies	does not apply
30	fully applies	fully applies	does rather not apply	does rather not apply	does rather not apply
31	fully applies	largely applies	largely applies	largely applies	fully applies
32	fully applies	fully applies	fully applies	does not apply	does not apply
33	fully applies	fully applies	fully applies	fully applies	fully applies
34	does not apply	does not apply	does not apply	does not apply	does not apply
35	partially applies	does rather not apply	largely applies	fully applies	partially applies
36	fully applies	fully applies	fully applies	fully applies	fully applies
37	fully applies	fully applies	fully applies	fully applies	fully applies
38	fully applies	fully applies	does not apply	does not apply	partially applies
39	fully applies	fully applies	does rather not apply	largely applies	does rather not apply
40	fully applies	fully applies	does not apply	does not apply	does not apply
41	fully applies	largely applies	largely applies	largely applies	largely applies
42	partially applies	does rather not apply	does rather not apply	partially applies	does not apply
43	fully applies	largely applies	does rather not apply	largely applies	largely applies
44	fully applies	fully applies	fully applies	fully applies	fully applies
45	fully applies	largely applies	does rather not apply	largely applies	largely applies
46	fully applies	fully applies	fully applies	fully applies	largely applies
47	does not apply	does not apply	does not apply	does not apply	does not apply
48	fully applies	fully applies	fully applies	fully applies	fully applies
49	fully applies	largely applies	partially applies	largely applies	largely applies
50	fully applies	partially applies	partially applies	does rather not apply	largely applies
51	partially applies	largely applies	largely applies	fully applies	largely applies
52	fully applies	does rather not apply	does not apply	does not apply	partially applies
53	does not apply	does not apply	does not apply	does not apply	does not apply
54	fully applies	largely applies	fully applies	fully applies	fully applies
55	fully applies	fully applies	largely applies	largely applies	largely applies
56	fully applies	fully applies	partially applies	fully applies	largely applies
57	does not apply	partially applies	partially applies	partially applies	does not apply
58	fully applies	fully applies	fully applies	fully applies	fully applies
59	largely applies	largely applies	does rather not apply	fully applies	fully applies
60	fully applies	fully applies	fully applies	fully applies	fully applies
61	fully applies	fully applies	largely applies	does rather not apply	does not apply
62	fully applies	fully applies	largely applies	fully applies	fully applies
63	fully applies	fully applies	fully applies	fully applies	fully applies
64	fully applies	fully applies	partially applies	partially applies	does rather not apply
65	fully applies	does not apply	largely applies	largely applies	largely applies
66	fully applies	fully applies	fully applies	fully applies	partially applies
67	fully applies	fully applies	partially applies	largely applies	largely applies
68	largely applies	largely applies	partially applies	fully applies	largely applies
69	partially applies	partially applies	fully applies	fully applies	partially applies
70	fully applies	partially applies	partially applies	fully applies	largely applies
71	partially applies	partially applies	largely applies	largely applies	does not apply
72	fully applies	largely applies	largely applies	fully applies	partially applies
73	does rather not apply	does rather not apply	does not apply	does not apply	does not apply
74	partially applies	partially applies	does not apply	does not apply	partially applies
75	partially applies	largely applies	largely applies	fully applies	does not apply
76	fully applies	fully applies	fully applies	fully applies	fully applies
77	fully applies	fully applies	fully applies	fully applies	fully applies
78	fully applies	fully applies	partially applies	does not apply	largely applies
79	fully applies	partially applies	does not apply	does not apply	does not apply
80	largely applies	does rather not apply	does not apply	does rather not apply	does not apply
81	largely applies	largely applies	largely applies	largely applies	largely applies
82	fully applies	largely applies	does rather not apply	does rather not apply	partially applies

#	Question Code				
	4.1.a1	**4.1.a2**	**4.1.a3**	**4.1.a4**	**4.1.a5**
83	partially applies	largely applies	partially applies	largely applies	partially applies
84	fully applies	fully applies	fully applies	fully applies	fully applies
85	fully applies	fully applies	largely applies	largely applies	largely applies
86	fully applies	largely applies	does rather not apply	largely applies	largely applies
87	fully applies	fully applies	fully applies	fully applies	fully applies
88	fully applies	fully applies	does not apply	largely applies	largely applies
89	largely applies	largely applies	partially applies	partially applies	partially applies
90	largely applies	largely applies	does rather not apply	does rather not apply	partially applies
91	fully applies	fully applies	fully applies	fully applies	fully applies
92	largely applies	fully applies	partially applies	largely applies	partially applies
93	partially applies	partially applies	partially applies	largely applies	largely applies
94	fully applies	fully applies	largely applies	largely applies	partially applies
95	largely applies	does rather not apply	fully applies	largely applies	fully applies
96	fully applies	largely applies	does rather not apply	largely applies	partially applies
97	fully applies	fully applies	fully applies	fully applies	fully applies
98	fully applies	fully applies	partially applies	partially applies	largely applies
99	does rather not apply	largely applies	does rather not apply	does rather not apply	does not apply
100	fully applies	fully applies	fully applies	fully applies	fully applies
101	fully applies	does rather not apply	largely applies	does rather not apply	fully applies
102	largely applies	largely applies	does not apply	partially applies	does not apply
103	does rather not apply	does not apply	partially applies	does rather not apply	does not apply
104	fully applies	fully applies	fully applies	fully applies	fully applies
105	fully applies	fully applies	fully applies	does rather not apply	largely applies
106	fully applies	fully applies	fully applies	fully applies	partially applies
107	fully applies	does not apply	does rather not apply	largely applies	does not apply
108	fully applies	fully applies	fully applies	fully applies	fully applies
109	fully applies	fully applies	does not apply	does not apply	does not apply
110	fully applies	fully applies	largely applies	partially applies	fully applies
111	does not apply	does not apply	does rather not apply	does rather not apply	does not apply
112	fully applies	largely applies	largely applies	largely applies	largely applies
113	partially applies	fully applies	partially applies	partially applies	partially applies
114	partially applies	largely applies	largely applies	largely applies	largely applies
115	fully applies	partially applies	does rather not apply	fully applies	largely applies
116	partially applies	partially applies	partially applies	partially applies	partially applies
117	fully applies	fully applies	fully applies	fully applies	fully applies
118	fully applies	fully applies	fully applies	fully applies	fully applies
119	fully applies	largely applies	does rather not apply	largely applies	fully applies
120	fully applies	fully applies	does rather not apply	fully applies	does rather not apply
121	fully applies	fully applies	fully applies	fully applies	fully applies
122	fully applies	fully applies	partially applies	fully applies	fully applies
123	does rather not apply	does rather not apply	does rather not apply	does rather not apply	does rather not apply
124	does rather not apply	does not apply	does not apply	partially applies	largely applies
125	fully applies	fully applies	does rather not apply	largely applies	fully applies
126	fully applies	fully applies	fully applies	fully applies	fully applies
127	fully applies	fully applies	does rather not apply	fully applies	partially applies
128	fully applies	fully applies	partially applies	fully applies	fully applies
129	fully applies	partially applies	partially applies	largely applies	partially applies
130	fully applies	fully applies	largely applies	largely applies	fully applies
131	fully applies	fully applies	largely applies	fully applies	fully applies
132	largely applies	largely applies	largely applies	largely applies	largely applies
133	fully applies	fully applies	fully applies	fully applies	fully applies
134	does not apply	fully applies	fully applies	fully applies	fully applies
135	fully applies	fully applies	largely applies	fully applies	fully applies
136	fully applies	fully applies	fully applies	fully applies	fully applies
137	does not apply	does not apply	does not apply	does not apply	does not apply
138	fully applies	fully applies	partially applies	does rather not apply	largely applies
139	fully applies	largely applies	largely applies	fully applies	partially applies
140	fully applies	largely applies	does not apply	does not apply	does not apply
141	fully applies	fully applies	fully applies	fully applies	fully applies
142	fully applies	fully applies	fully applies	fully applies	fully applies
143	fully applies	fully applies	fully applies	fully applies	fully applies
144	largely applies	largely applies	largely applies	largely applies	largely applies
145	fully applies	largely applies	partially applies	fully applies	partially applies
146	fully applies	fully applies	does rather not apply	largely applies	does not apply
147	fully applies	partially applies	partially applies	largely applies	fully applies
148	fully applies	partially applies	partially applies	fully applies	fully applies
149	fully applies	fully applies	does not apply	fully applies	largely applies
150	fully applies	fully applies	fully applies	largely applies	largely applies
151	does rather not apply	does rather not apply	does not apply	does rather not apply	fully applies
152	largely applies	fully applies	largely applies	largely applies	largely applies

#	Question Code				
	4.1.a1	**4.1.a2**	**4.1.a3**	**4.1.a4**	**4.1.a5**
153	partially applies	partially applies	partially applies	largely applies	largely applies
154	fully applies	fully applies	does not apply	fully applies	fully applies
155	partially applies	largely applies	partially applies	largely applies	largely applies
156	fully applies	does rather not apply	does rather not apply	fully applies	fully applies
157	largely applies	largely applies	partially applies	partially applies	partially applies
158	largely applies	largely applies	largely applies	largely applies	largely applies
159	does rather not apply	does rather not apply	partially applies	partially applies	partially applies
160	does not apply	does rather not apply	does not apply	does not apply	does not apply
161	does rather not apply	does not apply	does not apply	partially applies	does not apply
162	does rather not apply	does rather not apply	does not apply	largely applies	does rather not apply
163	fully applies	largely applies	does rather not apply	largely applies	does rather not apply
164	fully applies	fully applies	largely applies	fully applies	fully applies
165	fully applies	fully applies	largely applies	fully applies	fully applies
166	largely applies	partially applies	partially applies	largely applies	largely applies
167	fully applies	fully applies	does rather not apply	partially applies	largely applies
168	fully applies	fully applies	fully applies	fully applies	fully applies
169	fully applies	fully applies	fully applies	fully applies	fully applies
170	does not apply	does not apply	partially applies	largely applies	does rather not apply
171	largely applies	largely applies	largely applies	largely applies	largely applies
172	fully applies	fully applies	fully applies	fully applies	fully applies
173	partially applies	partially applies	does rather not apply	partially applies	does rather not apply
174	fully applies	fully applies	does not apply	fully applies	fully applies
175	largely applies	largely applies	does rather not apply	largely applies	fully applies
176	fully applies	partially applies	largely applies	largely applies	does rather not apply
177	fully applies	fully applies	partially applies	largely applies	largely applies
178	does rather not apply	partially applies	partially applies	partially applies	partially applies
179	does not apply	does not apply	does not apply	does not apply	does not apply
180	fully applies	fully applies	does not apply	partially applies	largely applies
181	fully applies	does not apply	does not apply	largely applies	does not apply
182	fully applies	fully applies	partially applies	partially applies	largely applies
183	does rather not apply	partially applies	largely applies	partially applies	partially applies
184	partially applies	partially applies	partially applies	partially applies	partially applies
185	largely applies	largely applies	largely applies	partially applies	largely applies
186	fully applies	fully applies	fully applies	fully applies	partially applies
187	fully applies	does not apply	does rather not apply	largely applies	does not apply
188	largely applies	largely applies	largely applies	largely applies	largely applies
189	partially applies	fully applies	does rather not apply	largely applies	partially applies
190	does rather not apply	does not apply	does rather not apply	partially applies	does rather not apply
191	largely applies	partially applies	does not apply	does not apply	largely applies
192	fully applies	does rather not apply	does rather not apply	largely applies	fully applies
193	largely applies	largely applies	largely applies	partially applies	largely applies
194	fully applies	fully applies	fully applies	fully applies	fully applies
195	largely applies	partially applies	does not apply	does rather not apply	does not apply
196	fully applies	partially applies	largely applies	does rather not apply	fully applies
197	fully applies	fully applies	partially applies	largely applies	does rather not apply
198	partially applies	does rather not apply	does not apply	does rather not apply	does rather not apply
199	fully applies	fully applies	does rather not apply	partially applies	does rather not apply
200	fully applies	fully applies	largely applies	fully applies	largely applies
201	fully applies	fully applies	partially applies	does rather not apply	partially applies
202	does not apply	does rather not apply	largely applies	fully applies	partially applies
203	fully applies	fully applies	partially applies	partially applies	does not apply
204	does not apply	does not apply	does not apply	largely applies	does not apply
205	fully applies	fully applies	fully applies	fully applies	fully applies
206	partially applies	fully applies	does not apply	does not apply	does not apply
207	largely applies	fully applies	partially applies	largely applies	partially applies
208	largely applies	does rather not apply	largely applies	does rather not apply	does rather not apply
209	partially applies	does rather not apply	does not apply	fully applies	does rather not apply
210	partially applies	fully applies	does rather not apply	does rather not apply	does not apply
211	largely applies	largely applies	does rather not apply	partially applies	does rather not apply
212	fully applies	fully applies	largely applies	largely applies	partially applies
213	fully applies	fully applies	partially applies	largely applies	largely applies
214	fully applies	fully applies	partially applies	partially applies	partially applies
215	fully applies	fully applies	partially applies	fully applies	fully applies
216	largely applies	fully applies	fully applies	fully applies	partially applies
217	does rather not apply	largely applies	largely applies	does rather not apply	fully applies
218	fully applies	fully applies	fully applies	fully applies	fully applies
219	fully applies	fully applies	largely applies	fully applies	fully applies
220	fully applies	does not apply	does not apply	does rather not apply	does not apply
221	fully applies	fully applies	does rather not apply	partially applies	fully applies
222	partially applies	partially applies	does not apply	does not apply	does not apply

#	Question Code				
	4.1.a1	**4.1.a2**	**4.1.a3**	**4.1.a4**	**4.1.a5**
223	partially applies	partially applies	partially applies	partially applies	partially applies
224	partially applies	partially applies	does rather not apply	fully applies	does rather not apply
225	fully applies	fully applies	fully applies	fully applies	fully applies
226	fully applies	fully applies	fully applies	fully applies	fully applies
227	fully applies	fully applies	largely applies	fully applies	fully applies
228	fully applies	fully applies	does rather not apply	partially applies	largely applies
229	fully applies	fully applies	fully applies	fully applies	fully applies
230	largely applies	largely applies	partially applies	largely applies	does rather not apply
231	partially applies	partially applies	does rather not apply	does rather not apply	does rather not apply
232	does not apply	partially applies	largely applies	largely applies	largely applies
233	partially applies	partially applies	does not apply	does not apply	partially applies

Table A.14: Survey participant answers for questions 4.1.a1 to 4.1.a5

#	Question Code												
	4.2.a1	**4.2.a2**	**4.2.a3**	**4.2.a4**	**4.2.a5**	**4.2.a6**	**4.2.a7**	**5.1**	**5.2**	**5.3**	**5.4**	**5.5**	**5.6**
1	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	10	50000	1	female	47
2	0	0	0	0	0	0	0	Wagram	16	100000	1	male	26
3	1	0	0	0	0	0	0	Weinviertel	7	35000	1	male	43
4	0	0	0	0	0	0	0	Kremstal	75	800000	1	female	24
5	0	0	1	0	0	0	0	Kamptal	15	60000	1	male	42
6	0	0	0	0	0	0	0	Kremstal	10	30000	1	male	48
7	0	0	1	1	0	0	0	Neusiedlersee	11		0	female	61
8	0	0	0	0	0	0	0	Neusiedlersee	14	80000	1	male	36
9	0	0	0	0	0	0	0	Südsteiermark	10	30000	1	male	49
10	0	0	0	0	0	0	0	Neusiedlersee	11	50000	1	male	35
11	0	0	0	0	0	0	0	Kamptal	12	40000	1	male	36
12	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	14	45000	1	male	41
13	0	0	0	0	0	0	0	Kremstal	11	80000	1	male	36
14	0	0	0	0	0	0	0	Mittelburgenland			0	female	49
15	0	0	0	0	0	0	0	Kamptal	65	800000	1	male	50
16	0	0	0	0	0	0	0	Kamptal	10	45000	1	male	38
17	0	0	0	0	0	0	0	Kamptal	42	2200	0	male	43
18	0	0	0	0	0	0	0	Südburgenland	11	60000	1	male	42
19	0	0	0	0	0	0	0	Neusiedlersee	13		1	male	28
20	0	0	0	0	0	0	0	Kamptal	14	50000	1	male	33
21	0	0	1	0	0	0	0	Südoststeiermark	7		1	male	45
22	1	1	1	0	0	0	0	Thermenregion	7	30000	1	male	50
23	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	7	45000	1	male	55
24	0	0	0	0	0	0	0	Südsteiermark	21	200000	1	male	33
25	0	0	0	0	0	0	0	Kremstal	15	60000	1	male	62
26	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	10	1500000	1	male	38
27	0	0	0	0	0	0	0	Südburgenland	6	40000	1	female	40
28	0	0	1	0	0	0	0	Thermenregion	8		1	female	30
29	0	0	0	0	0	0	0	Südsteiermark	6	20000	0	male	50
30	0	0	1	0	0	0	0	Neusiedlersee	50	400000	1	female	53
31	0	0	0	0	0	0	0	Kremstal	8	50000	1	male	51
32	0	0	0	1	0	0	0	Wachau	4		1	female	33
33	0	0	0	0	0	0	0	Weinviertel	20		1	male	40
34	0	0	1	0	0	0	0	Weinviertel	0.22	100	0	male	50
35	0	0	0	0	0	0	0	Neusiedlersee	17	50000	1	male	34
36	0	0	0	0	0	0	0	Thermenregion	10	35000	1	male	59
37	0	0	0	0	0	0	0	Südsteiermark	5	25000	1	male	34
38	0	0	1	0	0	0	0	Weinviertel	9	50000	1	male	42
39	0	0	0	0	0	0	0	Weinviertel	26	140000	1	male	49
40	0	0	0	0	0	0	1	Neusiedlersee	14	60000	1	male	56
41	0	0	0	0	0	0	0	Wien	4	2000	1	male	50
42	1	1	1	0	0	0	0	Carnuntum	3	5000	0	male	59
43	0	0	0	0	0	0	0	Neusiedlersee	15		1	female	55
44	0	0	0	0	0	0	0	Weinviertel	14	30000	1	male	32
45	0	0	0	1	0	0	0	Weinviertel	2	10000	0	male	43
46	0	0	0	0	0	0	0	Wachau	11	100000	1	male	33
47	0	0	1	0	0	0	0	Kamptal	14	20000	1	male	53
48	0	0	0	0	0	0	0	Weinviertel	7	15000	0	male	34
49	0	0	1	0	0	0	0	Neusiedlersee			0	male	53

#	Question Code												
	4.2.a1	**4.2.a2**	**4.2.a3**	**4.2.a4**	**4.2.a5**	**4.2.a6**	**4.2.a7**	**5.1**	**5.2**	**5.3**	**5.4**	**5.5**	**5.6**
50	0	1	1	0	0	0	0	Neusiedlersee	70	800000	1	male	34
51	0	0	0	0	0	0	0	Weinviertel	8	40000	1	male	29
52	0	0	1	0	0	0	0	Südsteiermark	8	12000	1	female	39
53	1	0	1	0	0	0	0	Thermenregion	5		0	male	56
54	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	10	30000	0	male	56
55	0	0	0	0	0	0	0	Weinviertel	7	50000	1	male	28
56	0	0	0	0	0	0	0	Wagram	14	80000	1	male	30
57	0	0	1	1	0	0	0	Weinviertel	7	20000	1	male	52
58	0	0	0	0	0	0	0	Weinviertel	18		1	male	40
59	0	0	0	0	0	0	0	Carnuntum	6	25000	1	female	43
60	0	0	0	0	0	0	0	Kamptal	13		1	female	40
61	0	0	0	0	0	0	0	Südsteiermark	6	18000	0	male	44
62	0	0	0	0	0	0	0	Weinviertel	16	65000	1	female	27
63	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	2	5000	0	male	48
64	0	0	0	0	0	0	0	Südsteiermark	10	80000	1	male	66
65	1	0	1	0	0	0	0	Weinviertel	4	30000	1	male	37
66	0	0	0	0	0	0	0	Südsteiermark			1	male	58
67	0	1	0	0	0	0	0	Weinviertel	37	80000	1	male	25
68	0	0	0	0	0	0	0	Neusiedlersee	12	50000	1	male	53
69	0	0	0	0	0	0	0	Neusiedlersee	10	30000	1	male	49
70	0	0	1	0	0	0	0	Kremstal	16	80000	1	male	33
71	0	0	1	0	0	0	0	Neusiedlersee	15	60000	1	male	45
72	0	0	0	0	0	0	0	Neusiedlersee	12	70000	1	male	39
73	1	0	0	0	0	0	0	Wachau	4	10000	0	male	53
74	0	0	0	0	1	1	0	Weinviertel	54	1000	0	male	50
75	0	0	0	1	0	0	0	Neusiedlersee	11	30000	1	male	46
76	0	0	0	0	0	0	0	Wien	5	15000	1	female	36
77	0	0	0	0	0	0	0	Traisental	18	110000	1	male	31
78	1	0	0	0	0	0	0	Südoststeiermark	10		1	male	33
79	1	0	0	0	0	0	0	Neusiedlersee-Hügelland	14	30000	1	male	37
80	1	0	1	0	0	0	0	Weinviertel	12	15000	0	male	48
81	0	0	0	0	0	0	0	Südoststeiermark	11	35000	1	male	26
82	0	0	0	0	0	0	0	Wachau	8	45000	1	male	38
83	0	0	0	0	0	0	0	Neusiedlersee	7	15000	0	male	58
84	0	0	0	0	0	0	0	Kremstal	5	100000	1	male	22
85	0	0	0	0	0	0	0	Südoststeiermark	6	20000	1	female	38
86	0	0	0	0	0	0	0	Mittelburgenland	15	40000	1	male	55
87	0	0	0	0	0	0	0	Wien	15	50000	1	female	56
88	0	0	0	1	0	0	0	Wien	1	600	1	female	67
89	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	4.6	20000	0	male	36
90	0	0	0	0	0	0	0	Weinviertel	11	50000	0	male	40
91	0	0	0	0	0	0	0	Weinviertel	10	35000	1	male	47
92	0	0	0	0	0	0	0	Neusiedlersee	22	150000	1	male	39
93	0	0	0	0	0	0	0	Südoststeiermark	5	30000	1	male	48
94	0	0	0	0	0	0	0	Südsteiermark	7	40000	1	male	48
95	0	0	0	0	0	0	0	Thermenregion	5	18000	1	male	35
96	0	0	1	1	0	0	0	Weinviertel	4	15000	1	male	52
97	0	0	0	0	0	0	0	Südoststeiermark	8	40000	1	male	56
98	0	0	0	0	0	0	1	Carnuntum	22	120000	1	male	56
99	0	0	1	0	0	0	0	Weinviertel	6	5000	1	male	36
100	0	0	0	0	0	0	0	Neusiedlersee	13	80000	1	male	57
101	0	0	0	0	0	0	0	Südoststeiermark	9	20000	1	male	53
102	0	0	0	0	0	1	0	Neusiedlersee	9	50000	0	male	42
103	0	0	1	0	0	0	0	Neusiedlersee	10	40000	1	male	30
104	0	1	0	0	0	0	0	Traisental	4	35000	0	male	59
105	0	0	0	0	0	0	0	Neusiedlersee	6	12000	1	male	40
106	0	0	0	0	0	0	0	Weinviertel	5	25000	0	male	40
107	0	0	1	0	0	0	0	Neusiedlersee-Hügelland	20	100000	1	male	50
108	0	0	0	0	0	0	0	Neusiedlersee	25	500000	1	male	33
109	1	0	0	0	0	0	0	Weinviertel	16	100000	1	male	48
110	0	0	0	0	0	0	0	Weinviertel	17	60000	1	male	22
111	1	0	1	0	0	0	0	Neusiedlersee-Hügelland	13	45000	1	female	44
112	0	0	0	0	0	0	0	Neusiedlersee	12	50000	1	female	45
113	0	0	0	1	0	0	0	Kremstal	2	10000	0	female	49
114	0	0	0	0	0	0	0	Neusiedlersee	13		1	female	52
115	1	0	1	0	0	0	0	Weinviertel	5.5	25000	0	female	49
116	0	0	0	0	0	0	0	Mittelburgenland	50	200000	1	female	30
117	0	0	0	0	0	0	0	Mittelburgenland	310	600000	1	female	42
118	0	0	0	0	0	0	0	Kamptal	7	20000	1	male	41
119	0	0	0	0	0	0	0	Weinviertel	13	70000	1	male	30

#	Question Code												
	4.2.a1	**4.2.a2**	**4.2.a3**	**4.2.a4**	**4.2.a5**	**4.2.a6**	**4.2.a7**	**5.1**	**5.2**	**5.3**	**5.4**	**5.5**	**5.6**
120	1	0	0	1	0	0	0	Kamptal	10	60000	1	male	36
121	0	0	0	0	0	0	0	Weinviertel	12	40000	1	male	49
122	0	0	0	0	0	0	0	Kamptal	44	100000	1	male	38
123	0	0	0	0	1	0	0	Südburgenland	0.2	1000	0	male	45
124	0	0	1	0	0	0	0	Weinviertel	16	50000	1	male	44
125	0	0	0	0	0	0	0	Neusiedlersee	16		1	male	32
126	0	0	0	0	0	0	0	Neusiedlersee	5	20000	0	male	44
127	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	9	25000	1	male	37
128	0	0	0	0	0	0	0	Südburgenland	5	20000	0	male	32
129	0	0	0	0	0	0	0	Weinviertel	22	100000	1	female	25
130	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	8	35000	1	male	50
131	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	12	80000	1	female	40
132	0	0	0	0	0	0	0	Mittelburgenland			1	male	37
133	0	0	0	0	0	0	0	Südsteiermark	50	270000	1	male	27
134	0	0	0	0	0	0	0	Kamptal	46	350000	1	male	50
135	0	0	0	0	0	0	0	Weinviertel	9	30000	0	male	41
136	0	0	0	0	0	0	0	Thermenregion	20	80000	1	female	28
137	0	0	0	0	0	0	0	Weinviertel	11	40000	1	male	33
138	0	0	0	0	0	0	0	Thermenregion	40		1	male	45
139	0	0	0	0	0	0	0	Wagram	20	110000	1	female	35
140	0	0	0	0	0	0	0	Wagram	4	5000	0	male	41
141	0	0	0	0	0	0	0	Südsteiermark	27	120000	1	female	28
142	0	0	0	0	0	0	0	Mittelburgenland	11	30000	1	male	49
143	0	0	0	0	0	0	0	Thermenregion	15	50000	1	male	49
144	0	0	0	0	0	0	0	Neusiedlersee	6	30000	1	male	47
145	0	0	0	0	0	0	0	Weinviertel	4	15000	0	male	40
146	0	0	1	0	0	0	0	Thermenregion	3	6000	0	male	41
147	0	0	0	0	0	0	0	Kamptal			1	male	30
148	0	0	0	0	0	0	0	Kremstal	17	90000	1	male	23
149	0	0	0	0	0	1	0	Neusiedlersee-Hügelland	14	50000	1	female	23
150	0	0	0	0	0	0	0	Südsteiermark	2	15000	1	male	43
151	1	0	1	0	0	0	0	Wachau	4	24000	1	male	52
152	0	0	0	0	0	0	0	Wachau	5	30000	1	male	44
153	0	0	0	0	0	0	0	Südburgenland	2	10000	0	male	49
154	1	0	0	0	0	0	0	Südsteiermark	90	450000	1	male	39
155	0	0	0	0	0	0	0	Neusiedlersee	21	130000	1	male	29
156	0	0	0	0	0	0	0	Traisental	8	30000	1	male	32
157	0	0	0	0	0	0	0	Weinviertel	12	5000	0	male	53
158	0	0	0	0	0	0	0	Wachau	10	10000	1	male	27
159	0	0	1	0	0	0	0	Südsteiermark	10	25000	1	male	34
160	1	0	0	0	0	0	0	Südburgenland	1	5000	0	male	77
161	0	1	0	0	0	0	0	Neusiedlersee-Hügelland	5	7000	1	female	49
162	1	0	1	0	0	0	0	Weinviertel	3	15000	0	male	47
163	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	12	40000	1	male	50
164	0	0	0	0	0	0	0	Neusiedlersee			1	male	29
165	0	0	0	0	0	0	0	Weinviertel	10	10000	1	male	34
166	1	0	0	0	0	0	0	Südburgenland	2	10000	0	female	56
167	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	16	60000	1	female	45
168	0	0	0	0	0	0	0	Südsteiermark	180	1000000	1	male	32
169	0	0	0	0	0	0	0	Wachau	2	8000	0	male	54
170	0	0	0	1	0	0	0	Wachau	5	30000	1	male	48
171	0	0	0	0	0	0	0	Neusiedlersee	15	40000	1	male	50
172	0	0	0	0	0	0	0	Carnuntum	20	110000	1	male	49
173	0	0	0	0	0	0	0	Südburgenland	25		1	male	38
174	0	1	0	0	0	0	0	Südburgenland	15	70000	1	male	36
175	0	0	0	0	0	0	0	Weinviertel	7	40000	1	male	46
176	1	0	0	0	0	0	0	Neusiedlersee	7	20000	0	female	49
177	0	0	0	0	0	0	0	Thermenregion	10	70000	1	male	55
178	0	0	1	1	0	0	0	Neusiedlersee-Hügelland	8		1	female	45
179	1	0	0	0	0	0	0	Neusiedlersee	10	30000	1	male	56
180	1	0	0	0	0	0	0	Wagram	14	80000	1	male	27
181	0	0	1	0	0	0	0	Thermenregion	3	6000	0	male	55
182	0	0	1	0	0	0	0	Weinviertel	4	13000	0	male	53
183	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	10		1	female	40
184	0	0	0	0	0	0	0	Kremstal	5	15000	0	female	52
185	0	0	0	0	0	0	0	Weinviertel	1.8	6000	0	male	29
186	0	0	0	0	0	0	0	Kamptal	21	80000	1	female	39
187	0	0	1	0	0	0	0	Neusiedlersee	4		0	female	46
188	0	0	0	0	0	0	0	Kremstal	10	20000	1	male	48
189	0	0	0	0	0	0	0	Thermenregion	3	6000	1	male	27

#	Question Code												
	4.2.a1	**4.2.a2**	**4.2.a3**	**4.2.a4**	**4.2.a5**	**4.2.a6**	**4.2.a7**	**5.1**	**5.2**	**5.3**	**5.4**	**5.5**	**5.6**
190	1	0	0	0	0	0	0	Wagram	3	10000	0	male	40
191	0	1	1	0	0	0	0	Weinviertel	3	10000	0	male	46
192	0	0	0	0	0	0	1	Neusiedlersee-Hügelland	1.5	7000	0	male	46
193	0	0	0	0	0	0	0	Neusiedlersee	13	65000	1	male	25
194	0	0	0	0	0	0	0	Neusiedlersee	7	25000	0	male	27
195	0	1	0	0	0	0	0	Kamptal	14		1	male	60
196	0	0	0	0	0	0	0	Weinviertel	6	20000	0	male	40
197	0	0	0	1	0	0	0	Weinviertel	9	22222	1	male	41
198	0	0	0	0	0	0	0	Wagram	14	70000	1	male	42
199	1	0	0	0	0	0	0	Weinviertel	4	5000	0	male	34
200	0	0	0	0	0	0	0	Weinviertel	5	25000	0	male	52
201	0	0	1	1	0	0	0	Carnuntum	11	50000	0	male	41
202	1	0	0	0	0	0	0	Wagram	14	10000	0	male	42
203	1	0	0	0	0	0	0	Neusiedlersee-Hügelland	10	30000	1	male	50
204	0	0	1	1	0	0	0	Weinviertel	1.8	9000	0	male	45
205	0	0	0	0	0	0	0	Neusiedlersee-Hügelland	11	100000	1	male	29
206	0	0	1	0	0	0	0	Neusiedlersee	8	30000	1	female	54
207	0	0	0	0	0	0	0	Neusiedlersee	7	30000	1	male	45
208	0	1	1	0	0	0	0	Weinviertel	18	80000	1	male	57
209	0	0	1	0	0	0	0	Traisental	10	60000	1	male	33
210	0	0	0	1	0	0	0	Weinviertel	3	6000	0	female	40
211	0	1	1	0	0	0	0	Kremstal	12	60000	1	male	29
212	0	0	1	0	0	0	0	Kamptal	10	50000	1	male	50
213	0	0	0	0	0	0	0	Kamptal	10	35000	1	male	46
214	0	0	0	0	0	0	0	Neusiedlersee			0	female	50
215	0	0	0	0	0	0	0	Weinviertel	13	60000	1	male	23
216	0	0	0	0	0	0	0	Südburgenland	6	22000	1	male	47
217	0	0	0	1	0	0	0	Südsteiermark	5	20000	1	male	46
218	0	0	0	0	0	0	0	Wachau	35	22000	1	male	53
219	0	0	0	0	0	0	0	Weinviertel	17	10000	1	male	23
220	0	0	1	0	0	0	0	Thermenregion	6		1	male	40
221	0	0	0	0	0	0	0	Weinviertel	8	20000	0	male	37
222	0	0	0	1	0	0	0	Neusiedlersee	4	5000	0	female	55
223	0	0	0	0	1	1	0	Kamptal	9	38000	1	female	44
224	0	0	0	0	0	0	0	Weinviertel	6	30000	0	female	52
225	0	0	0	0	0	0	0	Weststeiermark	55	230000	1	male	46
226	0	0	0	0	0	0	0	Weinviertel	13	50000	1	male	39
227	0	0	0	0	0	0	0	Südsteiermark	7	25000	0	female	54
228	0	0	0	0	0	0	0	Neusiedlersee			1	female	40
229	0	0	0	0	0	0	0	Weinviertel	7	30000	1	female	43
230	0	0	0	0	0	0	0	Neusiedlersee	8	30000	0	male	32
231	0	1	0	0	0	0	0	Neusiedlersee	2	3000	0	female	62
232	0	0	0	0	0	0	0	Neusiedlersee	16	50000	1	female	32
233	0	0	0	1	0	0	0	Carnuntum	2	2500	0	male	60

Table A.15: Survey participant answers for questions 4.2.a1 to 5.6

A.2 Winery Web Fitness

In this part the data for statistical analyses of the web fitness evaluation of winery websites is displayed. Tables A.16 to A.20 show evaluation results. In results tables, 1 indicates *Yes* or *Selected*, 0 indicates *No* or *Not selected*. This rule is not true for the part *Search Engines*, where the number shows the search rank.

#	Winery Info			Size				
	Region	**Name**	**Webaddress**	**S**	**M**	**L**	**XL**	**XXL**
1	Weinviertel	Weinhof Arocker	http://www.arocker.at	1	0	0	0	0
2	Weinviertel	Weingut Berger	http://www.bergerwein.at	0	1	0	0	0
3	Weinviertel	Weingut Dürnberg	http://www.duernberg.at	0	0	0	0	1
4	Weinviertel	Heuriger Faber	http://www.faber-wein.at	1	0	0	0	0
5	Weinviertel	Gatterburgsche Schlosskellerei	http://www.schlosskellerei.at	0	0	1	0	0
6	Weinviertel	Weinbau Greilinger	http://www.greilinger.at	0	1	0	0	0
7	Weinviertel	Genießerhof Haimer	http://www.haimer.at	0	1	0	0	0
8	Weinviertel	Weinbau Katzler	http://www.weinbau-katzler.at	1	0	0	0	0
9	Weinviertel	Winzerhof Krottendorfer	http://www.krottendorfer.at	0	1	0	0	0
10	Weinviertel	Weingut Lehner	http://www.weingut-lehner.com	1	0	0	0	0
11	Weinviertel	Weinhof Luckner	http://www.weinhof-luckner.at	0	1	0	0	0
12	Weinviertel	Weingut Minkowitsch	http://www.minkowitsch.at	0	1	0	0	0
13	Weinviertel	Weinbau Neunteufl	http://www.weinbau-neunteufl.at	1	0	0	0	0
14	Weinviertel	Weingut Pass	http://www.weingut-pass.at	0	1	0	0	0
15	Weinviertel	Weingut Pointner	http://www.weingut-pointner.at	0	1	0	0	0
16	Weinviertel	Weingut Prechtl	http://www.prechtl.at	0	1	0	0	0
17	Weinviertel	Weingut Rieder	http://www.riederwein.at	0	1	0	0	0
18	Weinviertel	Weingut Scheinerwein	http://www.scheinerwein.at	1	0	0	0	0
19	Weinviertel	Weinbau Schober	http://www.schober-wein.at	1	0	0	0	0
20	Weinviertel	Weingut Wallner	http://www.weingut-wallner.at	0	1	0	0	0
21	Weinviertel	Winzerhof Winkler	http://www.winklerweine.at	1	0	0	0	0
22	Weinviertel	Weingut Zuschmann-Schöfmann	http://www.zuschmann.at	0	0	1	0	0
23	Weinviertel	Weinhof Christoph Brandl	http://www.weinhof-brandl.at	1	0	0	0	0
24	Weinviertel	Weinbauernhof Diem	http://www.weinbauernhof-diem.at	0	1	0	0	0
25	Weinviertel	Weingut Epp	http://www.weingut-epp.at	1	0	0	0	0
26	Weinviertel	Weingut Gindl	http://www.weingut-gindl.at	1	0	0	0	0
27	Weinviertel	Weingut Kletzer	http://www.kletzer.at	0	0	1	0	0
28	Weinviertel	Weingut Ladentrog	http://www.ladentrog.at	1	0	0	0	0
29	Weinviertel	Weingut Schmidt	http://www.weingutschmidt.at	0	1	0	0	0
30	Kamptal	Weingut Am Berg	http://www.weingut-am-berg.at	0	1	0	0	0
31	Kamptal	Weingut Gerhard Deim	http://www.deim.at	0	1	0	0	0
32	Kamptal	Weingut Groll	http://www.weingut-groll.at	1	0	0	0	0
33	Kamptal	Bio Weingut Kemetner	http://www.kemetner.at	1	0	0	0	0
34	Kamptal	Weingut Röglsperger	http://www.roeglsperger.com	0	1	0	0	0
35	Kamptal	Weingut Turmhof	http://www.turmhof.at	1	0	0	0	0
36	Kamptal	Weingut Franz Loimer	http://www.f-loimer.at	0	1	0	0	0
37	Kamptal	Weingut Steininger	http://www.weingut-steininger.at	0	0	0	1	0
38	Kremstal	Weingut Buchegger	http://www.buchegger.at	0	1	0	0	0
39	Kremstal	Winzerhof Heinz Fink	http://www.winzerhof-fink.at	0	1	0	0	0
40	Kremstal	Kitzler Weingenuss	http://www.loess.at	0	1	0	0	0
41	Kremstal	Weingut Türk	http://www.weinguttuerk.at	0	1	0	0	0
42	Kremstal	Weingut Karl Proidl	http://www.proidl.at	0	1	0	0	0
43	Wachau	Weingut Donabaum	http://www.donabaum.at	1	0	0	0	0
44	Wachau	Weingut Schwaiger	http://www.weingut-schwaiger.at	0	1	0	0	0
45	Wachau	Weingut F.X. Pichler	http://www.fx-pichler.at	0	0	1	0	0
46	Traisental	Winzerhof Müllner	http://www.winzerhof-muellner.at	0	1	0	0	0
47	Traisental	Weingut Siedler	http://www.weingut-siedler.at	1	0	0	0	0
48	Wagram	Weingut Diwald	http://www.weingut-diwald.at	0	0	1	0	0
49	Wagram	Weingut Kolkmann	http://www.kolkmann.at	0	0	0	1	0
50	Wagram	Weingut Polsterer	http://www.weingut-polsterer.at	0	1	0	0	0
51	Wagram	Weinhof Ulzer	http://www.weinhof-ulzer.at	1	0	0	0	0
52	Wagram	Weingut Waltner	http://www.weingutwaltner.at	0	1	0	0	0
53	Thermenregion	Weingut Biegler	http://www.weingut-biegler.at	0	1	0	0	0
54	Thermenregion	Weingut Hecher	http://www.hecherwein.at	0	1	0	0	0
55	Thermenregion	Weingut Loimer	http://www.loimer.at	0	0	0	0	1
56	Thermenregion	Weingut Nigl	http://www.nigl.com	0	0	0	1	0
57	Thermenregion	Weinbau Dungel	http://www.dungel.at	1	0	0	0	0
58	Carnuntum	Weingut Markowitsch	http://www.markowitsch.at	0	0	0	0	1
59	Carnuntum	Weingut Rödler	http://www.roedler.at	1	0	0	0	0

#	Winery Info			Size				
	Region	Name	Webaddress	S	M	L	XL	XXL
60	Neusiedlersee	Winzerhof Paul Achs	http://www.winzerhof-achs.at	1	0	0	0	0
61	Neusiedlersee	Weingut Meinklang	http://www.meinklang.at	0	0	0	0	1
62	Neusiedlersee	Weingut Claus Preisinger	http://www.clauspreisinger.at	0	0	1	0	0
63	Neusiedlersee	Weinbau Friedrich	http://www.weinbau-friedrich.at	0	1	0	0	0
64	Neusiedlersee	Weingut Goldenits	http://www.goldenits.at	0	0	1	0	0
65	Neusiedlersee	Hannes Reeh	http://www.hannesreeh.at	0	0	0	1	0
66	Neusiedlersee	Weingut Hareter	http://www.hareter.at	0	0	1	0	0
67	Neusiedlersee	Weingut Kiss	http://www.weingut-kiss.at	0	1	0	0	0
68	Neusiedlersee	Weingut Köllan	http://www.schmelzer.at	0	1	0	0	0
69	Neusiedlersee	Weingut HST	http://www.hannessteurer.at	0	1	0	0	0
70	Neusiedlersee	Weingut Preschitz	http://www.preschitz.at	0	1	0	0	0
71	Neusiedlersee	Schuhmanns Weinhof	http://www.schuhmannsweinhof.at	0	1	0	0	0
72	Neusiedlersee	Zantho	http://www.zantho.com	0	0	0	0	1
73	Neusiedlersee	Nittnaus Hans	http://www.nittnaus.at	0	0	0	0	1
74	Neusiedlersee	Holzhammer Der Heurige	http://www.holzhammer.at	1	0	0	0	0
75	Neusiedlersee	Weingut Beck	http://www.weingut-beck.at	0	0	1	0	0
76	Neusiedlersee	Seewinkelhof Salzl	http://www.salzl.at	0	0	1	0	0
77	Neusiedlersee-Hügelland	Bayer Erbhof	http://www.bayer-erbhof.at	0	0	1	0	0
78	Neusiedlersee-Hügelland	Gut Oggau	http://www.gutoggau.com	0	1	0	0	0
79	Neusiedlersee-Hügelland	Toni Hartl	http://www.toni-hartl.at	0	0	1	0	0
80	Neusiedlersee-Hügelland	Kloster am Spitz	http://www.klosteramspitz.at	0	1	0	0	0
81	Neusiedlersee-Hügelland	Rebhof Sommer	http://www.wein-sommer.at	1	0	0	0	0
82	Neusiedlersee-Hügelland	Weingut Ernst Triebaumer	http://www.triebaumer.com	0	0	1	0	0
83	Neusiedlersee-Hügelland	Weingut Krauscher	http://www.krauscher.at	1	0	0	0	0
84	Neusiedlersee-Hügelland	Weingut Gabriel	http://www.weingut-gabriel.at	0	1	0	0	0
85	Mittelburgenland	Weingut Gesellmann	http://www.gesellmann.at	0	0	0	0	1
86	Mittelburgenland	Weingut K+K Kirnbauer	http://www.phantom.at	0	0	0	1	0
87	Mittelburgenland	Paul Lehrner	http://www.paul-lehrner.at	0	0	1	0	0
88	Mittelburgenland	Weingut Weninger	http://www.weninger.com	0	0	1	0	0
89	Mittelburgenland	Weingut Plöchl	http://www.weingut-ploechl.at	0	1	0	0	0
90	Südburgenland	Kopfensteiner	http://www.kopfensteiner.at	0	1	0	0	0
91	Süd-Oststeiermark	Engel Weine	http://www.engelweine.at	1	0	0	0	0
92	Süd-Oststeiermark	Weingut Kolleritsch	http://www.kolleritsch.com	0	1	0	0	0
93	Süd-Oststeiermark	Weinhof Pregartner	http://www.pregartner.com	1	0	0	0	0
94	Südsteiermark	Weingut Birnstingl	http://www.birnstingl.at	1	0	0	0	0
95	Südsteiermark	Weingut Polz	http://www.polz.co.at	0	0	0	0	1
96	Südsteiermark	Weingut Jöbstl	http://www.joebstl-weingut.at	0	1	0	0	0
97	Südsteiermark	Weingut Tschermonegg	http://www.tschermonegg.at	0	0	1	0	0
98	Südsteiermark	Peter Skoff	http://www.peter-skoff.at	0	0	1	0	0
99	Weststeiermark	Weingut Lazarus	http://www.weingut-lazarus.at	0	1	0	0	0
100	Wien	Winzerhof Leopold	http://www.winzerhof-leopold.at	1	0	0	0	0

Table A.16: Winery Web Fitness - Tested wineries and size category of tested wineries.

#	Technology & Services						Product info & sales					
	CMS	favicon	flash	galleries	language	font size	mobile	wines	prices	conditions	outlets	webshop	orders
1	Joomla	1	0	1	DE	0	1	1	0	0	0	0	email
2	no	0	0	0	DE	0	0	1	1	1	0	0	order form
3	Others	0	0	1	DE/EN	0	0	1	1	1	1	1	webshop
4	no	0	0	1	DE	0	0	0	0	0	0	0	no
5	Jimdo	0	0	1	DE	0	0	1	1	1	0	1	webshop
6	no	0	0	0	DE	0	0	1	0	0	1	0	email
7	no	0	0	0	DE/EN/CZ	0	0	1	0	0	0	0	no
8	Others	0	0	0	DE	0	0	1	1	1	0	1	webshop
9	no	0	0	1	DE	0	0	0	1	1	0	0	order form
10	Others	0	0	0	DE	0	0	1	1	1	1	0	order form
11	no	0	0	0	DE	0	0	1	1	1	0	0	email
12	Wordpress	1	0	1	DE/EN	0	1	1	1	1	0	1	webshop
13	Jimdo	0	1	0	DE	0	0	0	0	0	0	0	no
14	no	0	0	1	DE	0	0	1	0	1	0	0	order form
15	Others	0	0	0	DE	0	0	1	1	0	0	1	webshop
16	no	0	1	1	DE	0	0	1	0	0	1	0	email
17	no	0	1	1	DE	0	0	1	0	0	0	0	no
18	Others	1	0	1	DE	0	0	1	1	1	0	1	webshop

#	Technology & Services							Product info & sales					
	CMS	**favicon**	**flash**	**galleries**	**language**	**font size**	**mobile**	**wines**	**prices**	**conditions**	**outlets**	**webshop**	**orders**
19	Joomla	0	1	1	DE	0	0	1	0	0	0	0	email
20	no	1	0	0	DE	0	0	1	1	1	0	0	order form
21	no	0	0	1	DE	0	0	1	0	0	0	0	no
22	Typo3	1	0	1	DE	1	0	1	1	1	1	0	order form
23	no	0	0	0	DE	0	0	1	1	1	0	1	webshop
24	no	0	0	0	DE	0	0	1	0	0	0	0	email
25	no	0	0	0	DE	0	0	1	1	0	0	0	email
26	no	0	0	0	DE	0	0	1	1	0	0	0	order form
27	Jimdo	0	0	0	DE	0	0	1	0	0	0	0	no
28	Typo3	0	0	0	DE	0	0	1	0	0	0	0	no
29	Drupal	0	1	0	DE	0	0	1	0	0	0	0	email
30	no	0	0	0	DE	0	0	0	0	0	0	0	no
31	Others	1	0	1	DE	0	0	1	0	1	1	0	email
32	Joomla	0	0	0	DE	0	1	1	0	0	0	0	email
33	no	0	0	0	DE/EN	0	0	1	0	0	0	0	email
34	Joomla	1	0	1	DE	0	0	1	1	1	0	0	email
35	no	0	0	1	DE	0	0	1	0	0	0	0	email
36	no	0	0	0	DE	0	0	1	0	0	0	0	email
37	no	0	0	0	DE/EN	0	0	1	1	1	1	1	webshop
38	no	0	0	1	DE	0	0	1	0	0	1	0	email
39	no	1	0	0	DE	0	0	1	1	1	0	1	webshop
40	no	0	1	0	DE	0	0	1	1	1	0	0	email
41	no	1	0	0	DE/EN	0	0	1	0	0	1	0	no
42	no	1	0	1	DE/EN	0	0	1	1	1	0	0	email
43	no	0	0	0	DE	0	0	1	1	1	0	0	no
44	no	0	0	0	DE	0	0	1	1	0	0	0	email
45	no	1	0	1	DE/EN	0	0	0	0	0	1	0	no
46	no	0	1	0	DE	0	0	1	0	1	0	0	email
47	no	0	0	0	DE	0	0	0	0	0	0	0	no
48	no	0	1	1	DE/EN	0	0	1	0	0	1	0	email
49	no	1	0	0	DE/EN	0	0	1	0	1	1	0	email
50	Joomla	0	0	0	DE	0	1	0	0	0	0	0	no
51	no	1	1	1	DE	0	0	1	0	0	0	0	no
52	no	0	0	1	DE/EN	0	0	1	0	0	0	0	no
53	Typo3	1	0	0	DE	0	0	1	0	0	1	0	no
54	Wordpress	0	1	0	DE	0	0	1	0	0	0	0	no
55	Others	1	0	1	DE/EN	0	0	1	1	1	1	1	webshop
56	Typo3	1	0	1	DE	0	0	1	1	0	0	0	email
57	no	0	0	1	DE	0	0	1	1	1	1	0	email
58	no	0	0	0	DE/EN	0	0	1	1	1	1	0	order form
59	no	0	0	1	DE	0	0	1	1	1	0	0	order form
60	Typo3	0	0	1	DE	0	0	1	1	1	1	1	webshop
61	no	1	0	0	DE/EN/HU	0	0	1	1	1	1	0	thirdParty
62	Others	0	0	0	DE	0	0	1	0	0	1	0	no
63	Wordpress	0	0	1	DE	0	0	1	0	0	1	0	email
64	no	0	0	1	DE/EN	0	0	1	1	1	1	0	order form
65	no	0	0	0	DE	0	0	0	0	0	1	0	no
66	Joomla	1	0	1	DE	0	0	1	1	1	0	1	webshop
67	Others	0	1	0	DE/EN	0	0	1	1	0	0	1	webshop
68	no	0	0	0	DE	0	0	1	1	0	0	0	order form
69	Drupal	1	0	1	DE	0	1	1	0	0	1	0	no
70	no	0	0	0	DE	0	0	1	1	1	1	0	thirdParty
71	Typo3	0	0	0	DE	0	0	1	1	1	1	0	order form
72	Typo3	1	0	1	DE/EN	0	0	1	1	1	1	1	webshop
73	Others	1	0	0	DE/EN	0	0	1	0	0	1	0	no
74	no	0	0	0	DE	0	0	1	0	0	0	0	no
75	no	0	0	0	DE/EN	0	0	1	0	0	1	0	no
76	no	0	0	0	DE/EN	0	0	1	0	0	1	0	no
77	Typo3	0	0	1	DE/EN	0	0	1	1	1	1	0	order form
78	Typo3	0	1	1	DE/EN	0	0	1	1	1	1	1	webshop
79	Typo3	1	0	1	DE	0	0	1	1	1	1	1	webshop
80	Drupal	0	0	0	DE	0	0	1	0	0	1	0	no
81	no	0	0	0	DE	0	0	1	0	0	0	0	no
82	no	1	0	1	DE/EN	0	0	1	0	0	1	0	no
83	Others	1	0	1	DE	0	0	1	0	0	0	0	email
84	no	0	0	0	DE	0	0	1	1	0	0	0	order form
85	Typo3	0	0	1	DE/EN	0	0	1	1	1	1	1	webshop
86	Others	1	1	1	DE	0	0	1	0	0	1	0	no
87	Wordpress	0	0	1	DE	0	1	1	1	1	1	1	webshop

#	Technology & Services							Product info & sales					
	CMS	favicon	flash	galleries	language	font size	mobile	wines	prices	conditions	outlets	webshop	orders
88	Others	0	0	0	DE/EN/HU	0	0	1	1	0	1	1	webshop
89	no	0	0	0	DE	0	0	1	1	1	0	0	order form
90	Wordpress	0	0	0	DE	0	0	1	0	0	0	0	no
91	Wordpress	1	0	1	DE	0	1	1	1	1	1	0	order form
92	no	0	0	0	DE	0	0	1	1	1	0	1	webshop
93	no	0	0	0	DE	0	0	1	0	0	0	0	no
94	Joomla	1	0	1	DE	0	1	1	1	1	0	0	email
95	Others	1	0	1	DE/EN	0	0	1	0	1	1	0	no
96	Others	1	0	1	DE/EN	0	0	1	1	1	0	0	order form
97	no	1	1	1	DE/EN	0	0	1	0	0	1	0	no
98	Wordpress	0	0	1	DE	0	0	1	1	1	0	0	order form
99	no	0	0	0	DE	0	0	1	1	1	1	1	webshop
100	no	1	1	1	DE	0	0	1	0	0	0	0	no

Table A.17: Winery Web Fitness - Technology & service and product & sales information results.

#	General Information									Legal Info		
	winery	varieties	region	news	press	downloads	newsletter	social media	others	contact	imprint	AGB
1	1	1	1	1	0	0	0	0	0	map	1	0
2	1	1	1	1	0	1	0	0	0	sketch	0	0
3	1	1	1	1	0	0	1	1	0	address	1	1
4	1	1	0	1	0	0	0	0	0	address	0	0
5	1	1	1	1	0	0	1	1	1	map	1	1
6	1	0	0	1	0	0	0	0	1	address	1	0
7	1	1	0	1	0	0	0	0	1	sketch	0	0
8	1	1	1	0	0	0	0	0	0	address	1	1
9	1	0	0	0	0	0	0	0	1	address	1	0
10	1	0	1	1	1	1	0	1	0	sketch	1	1
11	1	1	1	1	0	0	1	0	1	address	1	0
12	1	1	0	1	1	1	1	1	1	map	1	1
13	1	1	0	1	0	0	0	0	0	map	1	0
14	1	1	1	1	0	0	0	0	0	sketch	0	0
15	1	0	0	1	0	0	0	0	1	map	0	1
16	1	1	1	1	1	1	0	0	0	address	1	0
17	1	1	0	0	0	0	0	0	1	map	1	0
18	1	1	0	1	0	0	0	0	0	address	1	1
19	1	1	0	0	0	0	0	0	0	sketch	0	0
20	1	0	0	1	0	0	0	0	0	address	1	1
21	1	1	0	1	0	0	0	0	0	map	0	0
22	1	1	0	1	1	1	1	0	1	address	1	1
23	1	1	1	1	0	0	0	1	0	map	1	1
24	1	1	1	1	0	1	0	0	1	sketch	1	0
25	1	1	0	0	0	0	0	0	0	address	0	0
26	1	1	1	0	0	0	0	0	0	address	0	0
27	1	1	1	1	0	0	1	1	0	address	1	0
28	1	1	0	1	0	0	0	0	1	address	1	0
29	1	0	1	1	0	0	0	0	0	map	0	0
30	0	0	0	1	0	0	0	0	0	address	0	0
31	1	1	1	1	0	0	0	0	0	sketch	1	0
32	1	1	0	1	0	0	0	0	0	map	1	0
33	1	1	1	1	0	0	0	0	0	map	0	0
34	1	0	0	1	0	0	1	0	0	address	1	0
35	1	0	1	1	0	0	0	0	1	map	1	0
36	1	0	0	1	0	0	0	0	0	sketch	1	0
37	1	0	1	1	0	0	0	0	0	address	1	0
38	1	0	1	1	1	1	1	1	1	map	1	0
39	1	0	1	0	0	1	0	0	0	address	1	1
40	1	0	0	0	0	0	0	0	1	address	1	0
41	1	1	1	1	1	1	0	0	0	map	1	0
42	1	0	1	0	0	0	0	0	1	map	1	0
43	1	1	1	0	0	0	0	0	0	address	1	0
44	1	1	0	0	0	0	0	0	1	address	1	0
45	1	1	1	1	1	1	0	0	0	map	1	0
46	1	0	0	1	0	0	0	0	1	map	1	0
47	1	1	1	1	0	0	0	0	0	address	1	0

#	General Information									Legal Info		
	winery	varieties	region	news	press	downloads	newsletter	social media	others	contact	imprint	AGB
48	1	1	1	1	1	1	0	1	0	map	1	1
49	1	1	1	1	0	0	0	0	0	sketch	0	0
50	1	1	1	0	0	0	0	0	0	nothing	0	0
51	1	1	1	1	0	0	0	0	0	map	0	0
52	1	0	0	1	0	0	0	0	0	address	1	0
53	1	0	0	1	0	0	0	1	0	map	1	0
54	1	0	1	1	0	0	0	0	0	address	0	0
55	1	1	1	1	1	1	1	1	0	address	1	1
56	1	1	1	1	1	1	1	1	0	map	1	0
57	1	0	0	1	0	0	1	0	1	map	1	0
58	1	1	1	1	1	1	0	0	0	sketch	1	0
59	1	0	1	1	0	0	1	0	0	sketch	0	1
60	1	1	0	1	0	0	0	1	0	address	1	1
61	1	1	0	1	1	1	0	1	1	map	1	1
62	1	1	1	1	1	1	0	1	0	address	1	0
63	1	0	0	1	0	0	0	0	1	map	0	0
64	1	0	0	1	1	1	0	0	0	sketch	1	0
65	1	1	1	1	0	0	0	0	0	address	0	0
66	1	0	1	1	0	1	1	1	0	address	1	1
67	1	0	0	1	1	1	0	0	0	sketch	1	0
68	1	1	0	0	0	0	0	0	0	sketch	1	0
69	1	0	0	1	0	0	0	0	1	map	1	0
70	1	0	1	1	0	0	0	0	0	address	0	1
71	1	1	1	1	0	0	0	0	0	map	0	1
72	1	1	1	1	1	1	0	1	0	address	1	1
73	1	1	1	0	1	1	0	0	0	address	1	0
74	1	1	1	0	0	0	0	0	0	sketch	0	0
75	1	1	1	1	1	1	0	0	0	address	1	0
76	1	1	1	1	0	0	0	0	0	sketch	1	0
77	1	1	1	1	1	1	1	1	1	map	1	1
78	1	0	0	1	1	1	1	0	1	sketch	1	1
79	1	1	1	1	1	1	0	0	0	address	1	1
80	1	0	0	1	1	1	0	0	1	address	1	0
81	1	1	0	1	0	0	0	0	0	address	1	0
82	1	1	1	1	0	0	0	0	0	address	1	0
83	1	1	1	1	0	0	0	1	0	map	1	0
84	1	0	1	1	0	0	1	0	1	map	1	0
85	1	1	1	1	1	1	1	0	0	address	1	1
86	1	1	1	1	1	1	0	0	0	map	1	0
87	1	1	1	1	1	1	1	0	0	map	1	1
88	1	1	1	1	1	1	1	0	0	sketch	1	1
89	1	0	0	1	0	0	0	0	0	sketch	1	1
90	1	1	1	1	1	1	1	1	0	map	1	0
91	0	1	1	1	0	0	0	1	0	map	1	1
92	1	0	1	1	0	0	1	0	1	description	1	1
93	1	1	1	1	0	0	0	0	0	sketch	0	0
94	1	0	1	1	0	0	0	0	0	map	1	0
95	1	1	1	1	0	0	0	1	0	map	1	1
96	1	1	1	1	0	0	0	0	0	sketch	1	1
97	1	0	1	1	0	0	0	1	0	map	1	0
98	1	0	1	1	0	1	0	1	1	map	1	0
99	1	1	0	1	0	0	0	0	1	sketch	1	1
100	1	0	0	1	0	0	0	0	0	description	1	0

Table A.18: Winery Web Fitness - General and legal information results.

ID	Look and Feel		Search Engines			Browser support			
	content	design	Google	Bing	Yahoo	IE	Safari	Chrome	Firefox
1	good	good	1	1	1	1	1	1	1
2	good	rather good	3	3	4	1	1	1	1
3	good	good	1	1	1	1	1	1	1
4	rather bad	bad	1	1	1	1	1	1	1
5	rather good	rather bad	1	1	1	1	1	1	1
6	neutral	neutral	1	1	1	1	1	1	1

ID	Look and Feel		Search Engines			Browser support			
	content	design	Google	Bing	Yahoo	IE	Safari	Chrome	Firefox
7	rather bad	bad	1	1	1	1	1	1	1
8	rather bad	neutral	1	1	2	1	1	1	1
9	good	good	1	1	1	1	1	1	1
10	rather good	neutral	1	1	1	1	1	1	1
11	rather good	rather bad	1	1	1	1	1	1	1
12	neutral	rather good	3	2	1	1	1	1	1
13	good	rather good	1	1	1	1	1	1	1
14	good	good	1	1	1	1	1	1	1
15	neutral	neutral	1	1	1	1	1	1	1
16	rather good	rather bad	1	1	1	1	1	1	1
17	good	rather good	1	1	2	1	1	1	1
18	neutral	rather good	1	1	4	1	1	1	1
19	neutral	neutral	4	5	3	1	1	1	1
20	rather good	neutral	2	1	1	1	1	1	1
21	neutral	bad	2	1	4	1	1	1	1
22	neutral	good	1	1	1	1	1	1	1
23	neutral	neutral	1	1	1	1	1	1	1
24	rather good	rather good	1	1	1	1	1	1	1
25	bad	rather bad	1	1	1	1	1	1	1
26	bad	bad	1	1	1	1	1	1	1
27	bad	bad	1	1	1	1	1	1	1
28	neutral	neutral	1	1	2	1	1	1	1
29	rather bad	bad	3	2	4	1	1	1	1
30	bad	neutral	2	1	1	1	1	1	1
31	rather good	rather good	1	1	1	1	1	1	1
32	neutral	rather bad	1	1	1	1	1	1	1
33	rather good	rather good	1	1	1	1	1	1	1
34	rather bad	neutral	1	1	1	1	1	1	1
35	good	rather good	1	1	1	1	1	1	1
36	bad	bad	1	1	1	1	1	1	1
37	rather good	rather bad	1	1	1	1	1	1	1
38	good	good	1	1	1	1	1	1	1
39	bad	bad	1	1	1	1	1	1	1
40	bad	neutral	1	1	0	1	1	1	1
41	good	neutral	1	1	1	1	1	1	1
42	good	rather good	1	1	1	1	1	1	1
43	good	neutral	1	2	2	1	1	1	1
44	neutral	neutral	1	1	1	1	1	1	1
45	good	good	1	1	1	1	1	1	1
46	neutral	neutral	1	1	1	1	1	1	1
47	rather bad	neutral	1	1	1	1	1	1	1
48	good	rather good	1	2	1	1	1	1	1
49	rather good	neutral	1	1	1	1	1	1	1
50	rather bad	bad	1	1	1	1	1	1	1
51	rather good	neutral	1	1	1	1	1	1	1
52	good	good	1	1	1	1	1	1	1
53	good	good	1	1	1	1	1	1	1
54	neutral	rather good	0	0	0	1	1	1	1
55	good	good	1	1	1	1	1	1	1
56	good	good	6	3	5	1	1	1	1
57	rather good	neutral	1	1	1	1	1	1	1
58	good	rather good	1	1	1	1	1	1	1
59	good	neutral	1	1	1	1	1	1	1
60	good	rather good	1	1	1	1	1	1	1
61	neutral	rather good	1	1	1	1	1	1	1
62	good	good	1	1	1	1	1	1	1
63	rather good	neutral	1	1	1	1	1	1	1
64	rather good	rather good	1	1	1	1	1	1	1
65	good	good	1	0	0	1	1	1	1
66	rather good	good	1	1	1	1	1	1	1
67	rather bad	rather bad	2	1	1	1	1	1	1
68	bad	bad	1	1	2	1	1	1	1
69	good	good	1	1	1	1	1	1	1
70	rather bad	rather bad	1	1	2	1	1	1	1
71	good	good	1	1	9	1	1	1	1
72	good	good	1	1	1	1	1	1	1
73	good	rather good	1	1	1	1	1	1	1
74	bad	bad	1	1	1	1	1	1	1
75	good	good	1	1	1	1	1	1	1

ID	Look and Feel		Search Engines			Browser support			
	content	design	Google	Bing	Yahoo	IE	Safari	Chrome	Firefox
76	rather good	rather good	1	1	1	1	1	1	1
77	good	good	1	1	1	1	1	1	1
78	good	good	1	1	1	1	1	1	1
79	good	good	1	1	1	1	1	1	1
80	good	good	1	1	1	1	1	1	1
81	bad	bad	1	1	1	1	1	1	1
82	rather bad	neutral	1	1	1	1	1	1	1
83	rather bad	neutral	1	1	1	1	1	1	1
84	rather good	neutral	1	1	1	1	1	1	1
85	good	good	1	1	1	1	1	1	1
86	good	rather good	1	1	1	1	1	1	1
87	rather good	rather good	1	1	1	1	1	1	1
88	good	good	1	1	1	1	1	1	1
89	neutral	bad	1	1	1	1	1	1	1
90	good	good	1	1	5	1	1	1	1
91	rather good	rather good	1	1	1	1	1	1	1
92	neutral	neutral	1	1	1	1	1	1	1
93	rather bad	bad	1	1	1	1	1	1	1
94	neutral	neutral	2	1	1	1	1	1	1
95	good	good	1	1	1	1	1	1	1
96	neutral	neutral	1	1	1	1	1	1	1
97	neutral	rather bad	1	1	1	1	1	1	1
98	good	good	1	1	2	1	1	1	1
99	neutral	neutral	1	1	1	1	1	1	1
100	neutral	rather bad	1	1	1	1	1	1	1

Table A.19: Winery Web Fitness - Look & feel, search engines and browser support results.

ID	Nibbler				
	AVG	accessability	experience	marketing	technology
1	6.5	7.8	6.1	1.3	8.4
2	3.9	4.4	3.4	1.5	3.8
3	3.4	3.7	4.2	2.7	3.7
4	4.3	5.3	3.1	1.1	5.2
5	6.1	6.8	4.8	1.7	7.6
6	6.7	8.3	4.5	1.4	8.2
7	3.7	3	3.2	1.5	3.5
8	5.6	6.4	4.3	1.1	6.2
9	6.1	8.4	4.7	0.5	7.7
10	4.4	4	4	2.1	4.4
11	4.9	5.3	3.5	1.8	5
12	6.9	9	7.2	3	8.1
13	6.6	7.9	5	1.6	8.2
14	3.5	3.9	3.2	1	4.3
15	4.3	4.2	3.6	1.6	4.3
16	4	3.9	2.9	2.4	3.4
17	3.9	4.3	2.7	1.3	3.9
18	5.2	5	4.1	2.8	4.7
19	4.2	4	3.2	1.8	4.3
20	3.8	4.2	3.6	0.8	4.5
21	5.5	7.6	4.2	0.7	7.6
22	5.9	6	3.4	2.8	5.1
23	4.2	4.4	3.8	1.7	4.3
24	3.4	4.3	2.9	0.5	3.3
25	4.8	6.1	3.9	0.7	4.9
26	4.6	5.6	3.9	1.2	4.4
27	6.4	7.4	5.3	1.7	7.8
28	4.3	4.9	2.8	1.1	4.5
29	3.9	3.8	2.8	1.1	3.8
30	4.1	5.4	4.3	0.8	7.5
31	4.4	5.6	3.5	0.7	5.2
32	6.5	8.4	5.7	1.4	8.2
33	4.4	4.9	3.1	1.4	4.2
34	5.1	6.1	3.7	1.4	4.9

ID	Nibbler				
	AVG	**accessability**	**experience**	**marketing**	**technology**
35	4.8	5.3	3.3	1.8	4.9
36	3.6	4.2	3.5	1	3.6
37	4	3	2.3	2.7	3
38	4.4	4.2	3.3	2	3.8
39	3.9	4.6	3.2	1.3	3.9
40	5.3	7.1	4.5	1.5	7.3
41	7.4	8	5.6	3.1	8.2
42	4.5	5.4	3.5	1.4	4.7
43	4.9	4.7	3.6	1.7	5.9
44	3.5	3.8	3	1.2	3.5
45	6.8	8	4.3	2.6	7.7
46	3.8	4.3	3	1.5	3.7
47	3.9	4.2	3.2	1.2	4
48	6.2	7.8	4.7	3.2	6.6
49	3	2.4	2	1.5	2.6
50	6.9	9.2	5.1	1.6	8
51	3.3	3.9	2.4	0.7	3.3
52	4.6	5.2	3.2	1.5	4.8
53	5.8	7	4	1.9	7.3
54	6.9	7.9	5.9	3.6	7.8
55	4.2	5.9	3.6	2.9	5.9
56	5	4.8	4.1	3.6	4.4
57	5.4	6.7	5.1	2.6	5.3
58	5.7	6.8	3.5	2.7	5.7
59	3.8	4.4	2.9	1.3	4.3
60	5.2	7.1	3.8	1.8	5.2
61	4.9	5.8	3.5	1.9	3.8
62	3.3	3.7	3.5	2.4	4.2
63	6.3	7.5	5.3	1.6	8.1
64	5.3	6.2	3.7	2.3	4.9
65	6.7	6.9	3.8	3.6	7.1
66	5.6	5.5	4.3	4.1	5.1
67	4.1	5.6	3.6	0.9	4.1
68	5.4	6.5	3.7	1.5	5.6
69	6.8	8.8	6.2	2.2	6.8
70	4.8	5.8	3.9	1.6	4.5
71	6.5	8.2	4.4	1.8	7.7
72	6.6	7.1	5	4.7	5.4
73	5.5	5.3	3.4	2.8	4.9
74	3	3.1	2.6	1.3	3.3
75	3.4	3.1	3.1	2.1	3.4
76	5.6	6.1	3.7	3	5.2
77	4.7	5.4	2.9	2.2	3.8
78	4.5	3.7	3	2.9	3.7
79	4.6	4.5	2.5	2	5.8
80	5.5	7.7	4.4	2	7.8
81	4.7	5.3	3.6	1.7	4.1
82	4	3.6	3.6	2.2	4.1
83	4.7	4.3	3.6	2.7	4.4
84	5.6	6.5	4.1	2	6.3
85	5.9	7.6	3.9	2.8	5.6
86	4.9	5.4	4.6	3.3	4.4
87	7.5	8.4	7.3	2.7	9.4
88	7	7.7	5.6	3.8	6.6
89	4.6	4.8	2.8	1.8	5
90	5.6	5.7	3.8	2.4	6.7
91	5.3	8.1	5.5	2.3	7.7
92	4	4	3.4	2.5	3.7
93	3.6	3.3	2.8	1.5	3.5
94	5.9	7.5	5.3	1.9	7.4
95	5.9	7.7	4.9	3.8	5.7
96	4.2	4.5	3.9	1.1	4.7
97	3.3	3.1	2	2.2	2.5
98	5.6	6.8	3.9	3	6.2
99	4.6	5.7	3.7	2.2	3.8
100	5.9	6.8	4.7	2.5	7.4

Table A.20: Winery Web Fitness - Results of automatic website evaluation tool Nibbler.

APPENDIX B

Screenshots

B.1 Application Screenshots

The following screenshots show the graphical user interfaces of the analyzed cellar management applications in chapter 4, Cellar Management Applications. All screenshots were taken on the 14th of May, 2014.

LBG Kellerbuch

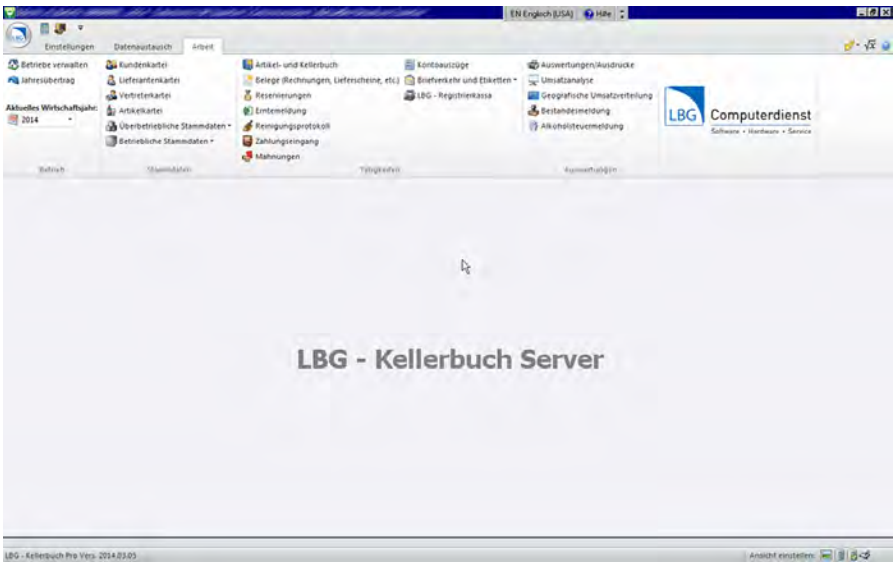

Figure B.1: LBG Kellerbuch - GUI

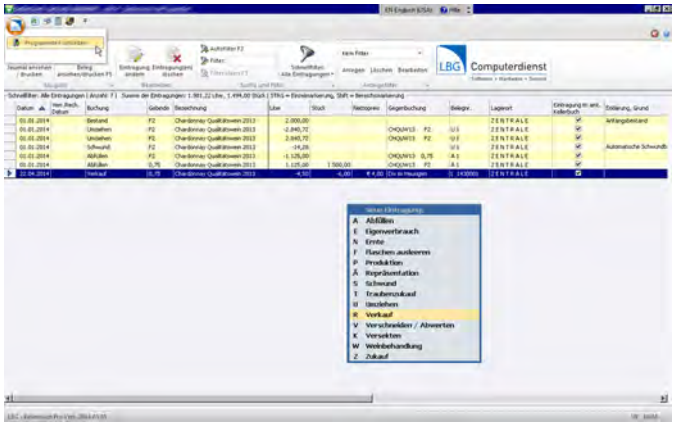

Figure B.2: LBG Kellerbuch - closing an open part of the application

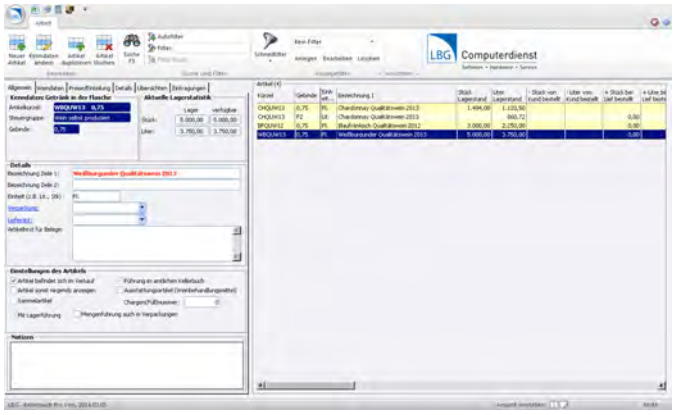

Figure B.3: LBG Kellerbuch - product overview

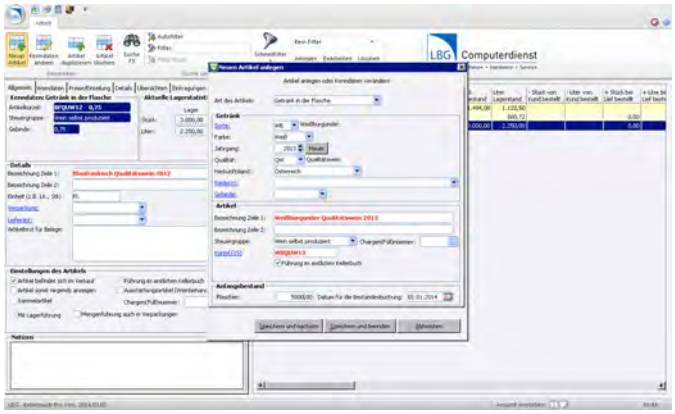

Figure B.4: LBG Kellerbuch - add a new product

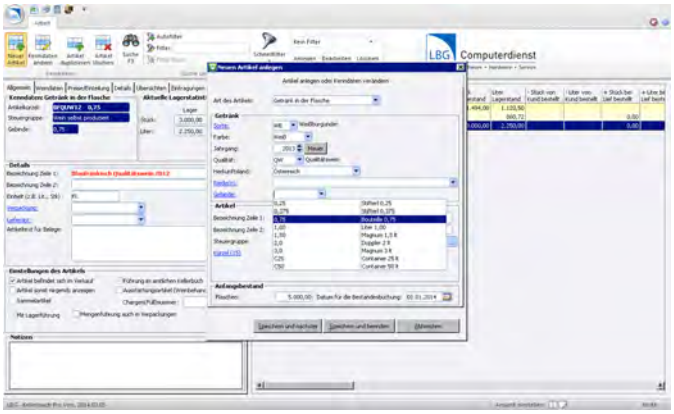

Figure B.5: LBG Kellerbuch - add a new product autocompletion

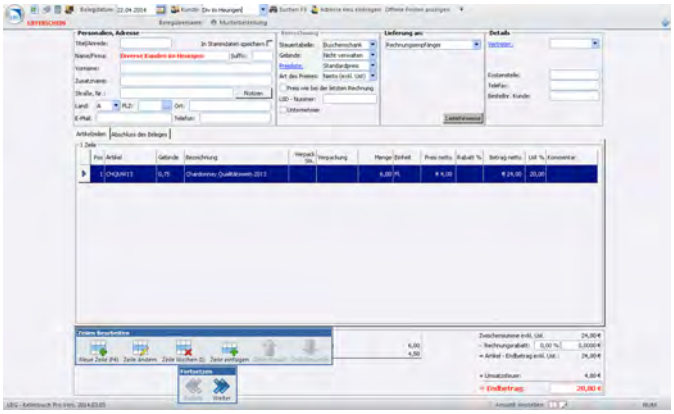

Figure B.6: LBG Kellerbuch - order management

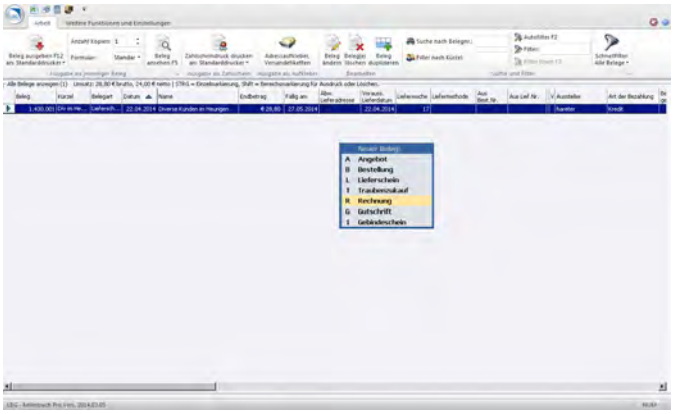

Figure B.7: LBG Kellerbuch - invoice management

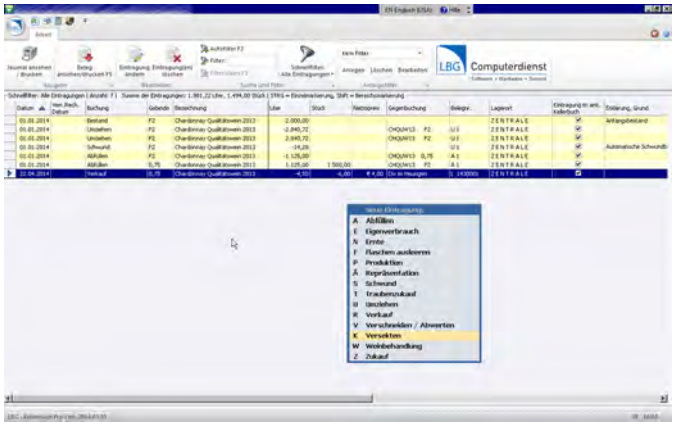

Figure B.8: LBG Kellerbuch - Kellerbuch management

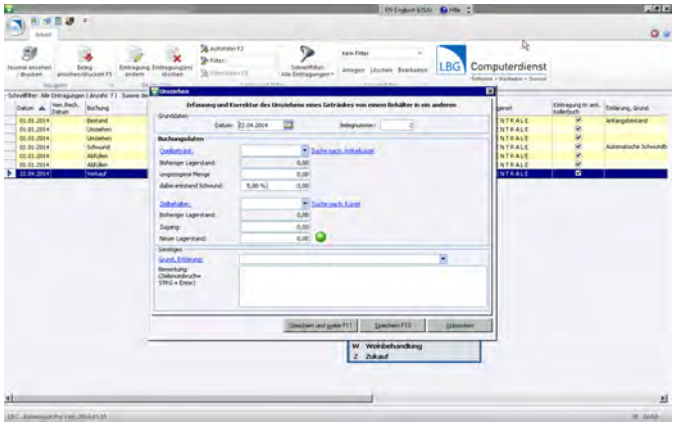

Figure B.9: LBG Kellerbuch - add task to Kellerbuch

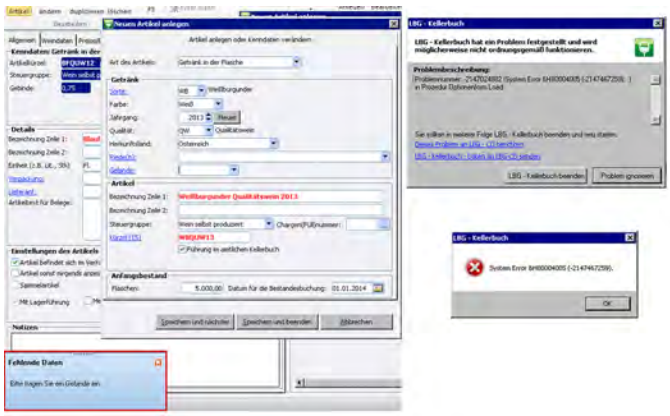

Figure B.10: LBG Kellerbuch - error messages

Weinbau-Online.de

Figure B.11: Weinbau Online - GUI

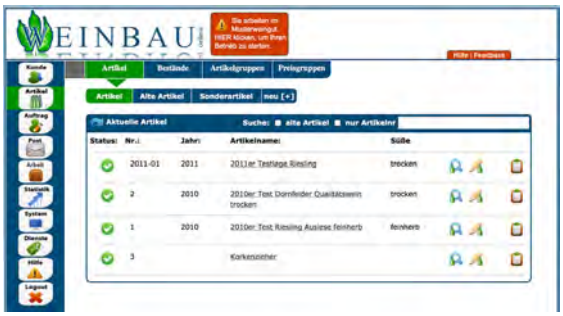

Figure B.12: Weinbau Online - products list

Figure B.13: Weinbau Online - add new product

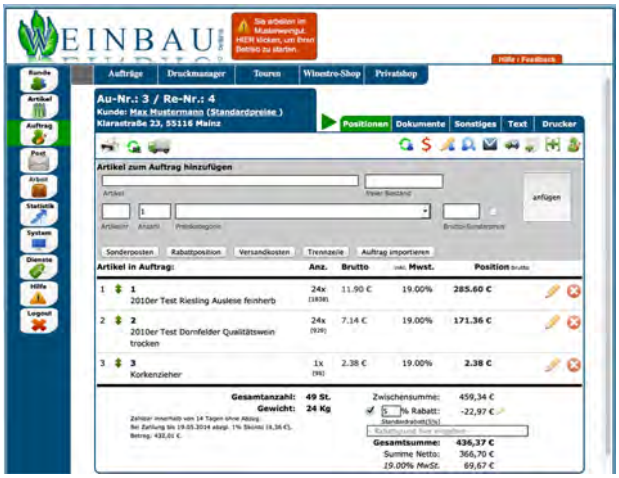

Figure B.14: Weinbau Online - order overview

Figure B.15: Weinbau Online - list of orders

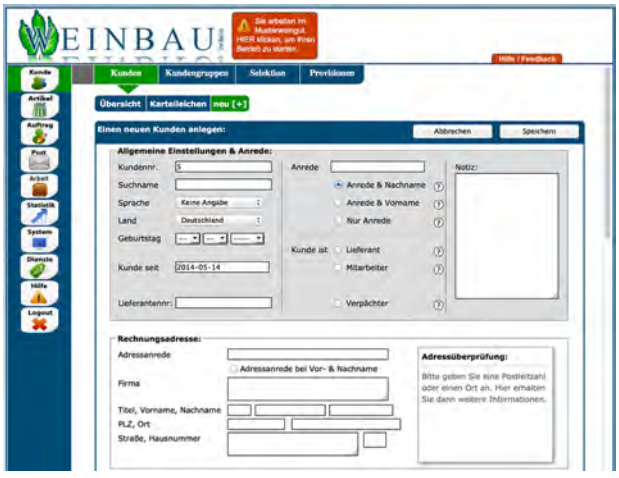

Figure B.16: Weinbau Online - add new customer

Figure B.17: Weinbau Online - Kellerbuch management

Figure B.18: Weinbau Online - add a new task to Kellerbuch

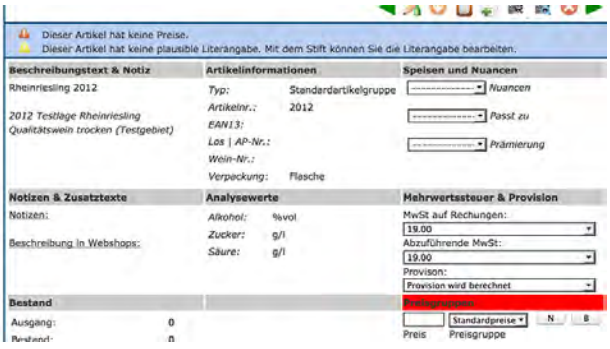

Figure B.19: Weinbau Online - error warnings

DAS Kellerbuch / DIE Warenwirtschaft

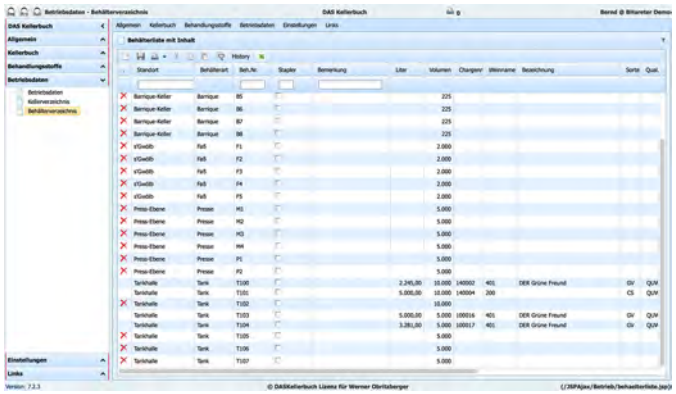

Figure B.20: DAS Kellerbuch - GUI

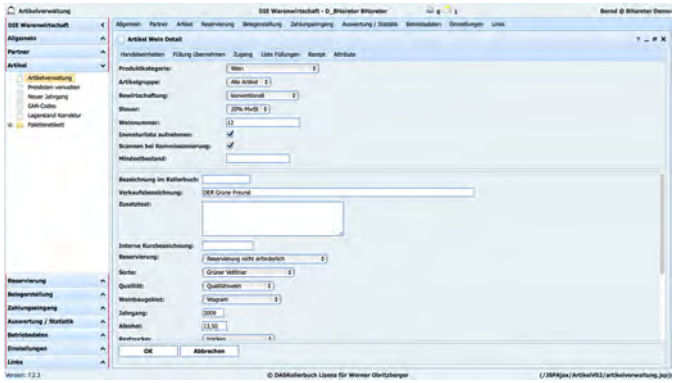

Figure B.21: DAS Kellerbuch - add a new product

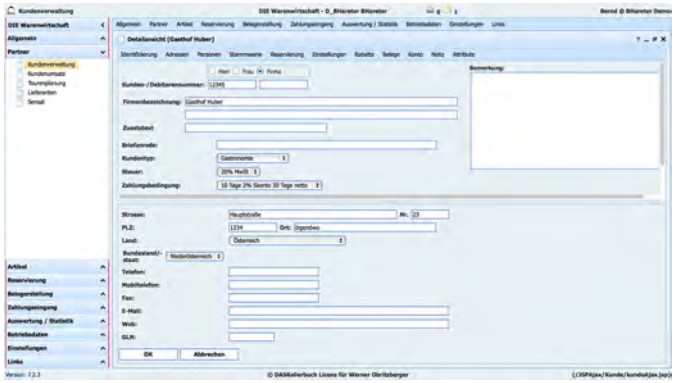

Figure B.22: DAS Kellerbuch - customer detail view

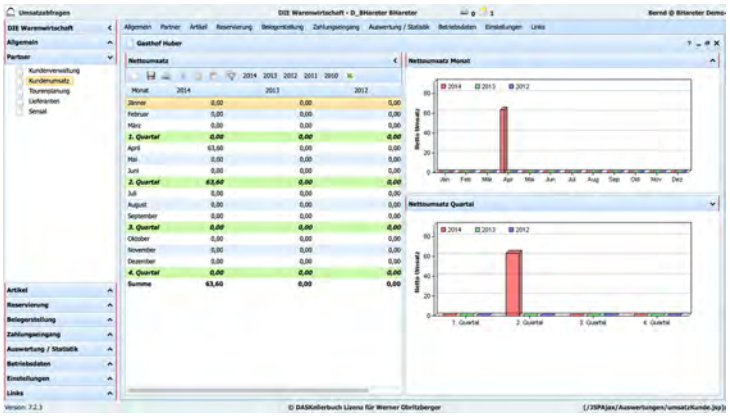

Figure B.23: DAS Kellerbuch - customer statistics

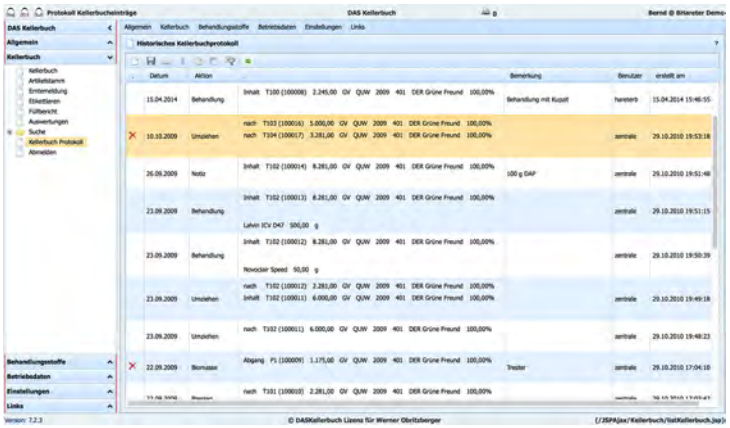

Figure B.24: DAS Kellerbuch - Kellerbuch overview

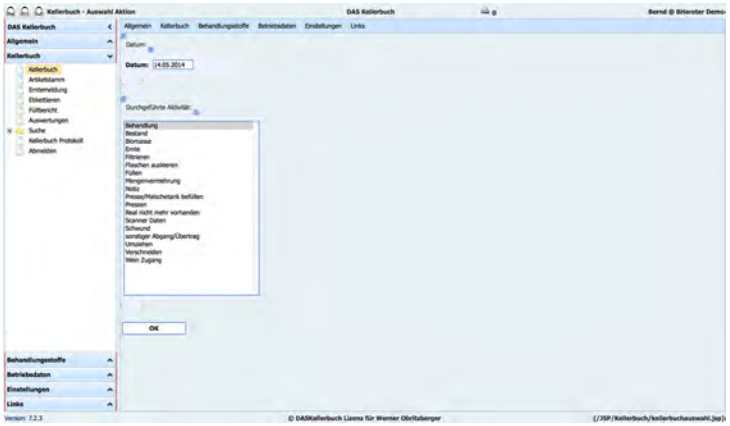

Figure B.25: DAS Kellerbuch - add task to Kellerbuch: Step 1

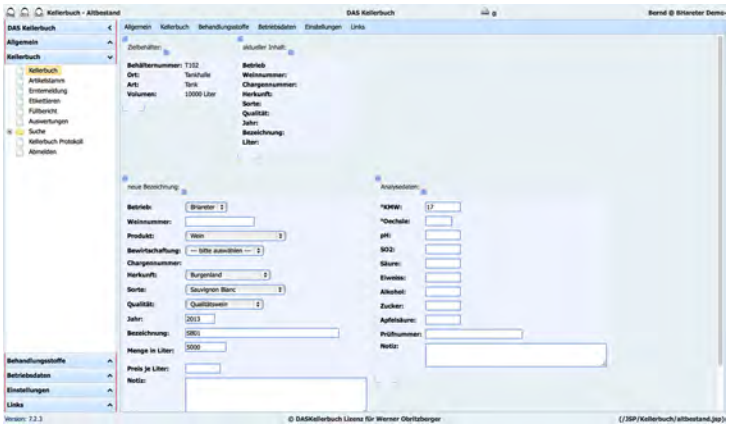

Figure B.26: DAS Kellerbuch - add task to Kellerbuch: Step 2

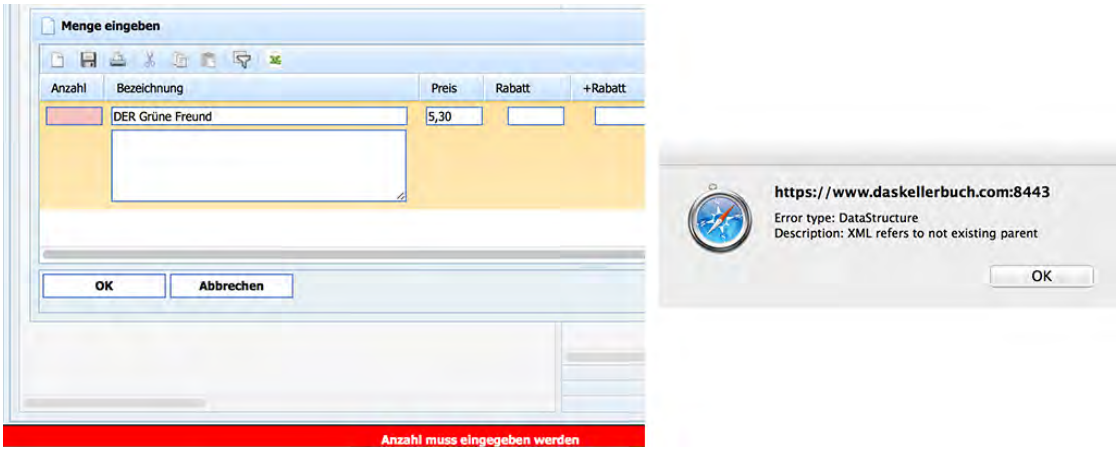

Figure B.27: DAS Kellerbuch - errors

Kellermanagement (Ing. Mauß)

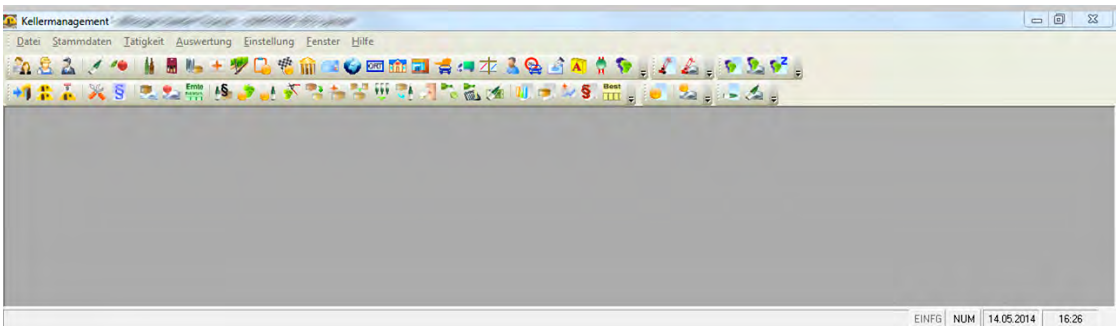

Figure B.28: Kellermanagement - GUI

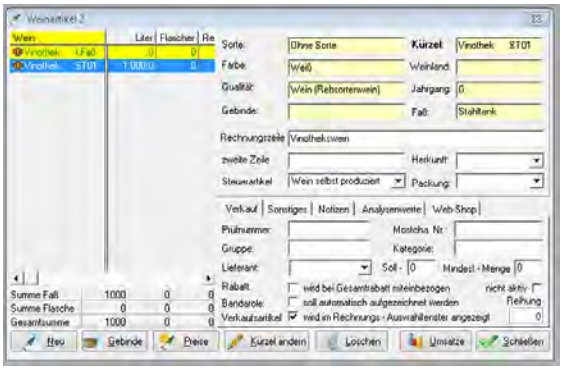

Figure B.29: Kellermanagement - add a new product

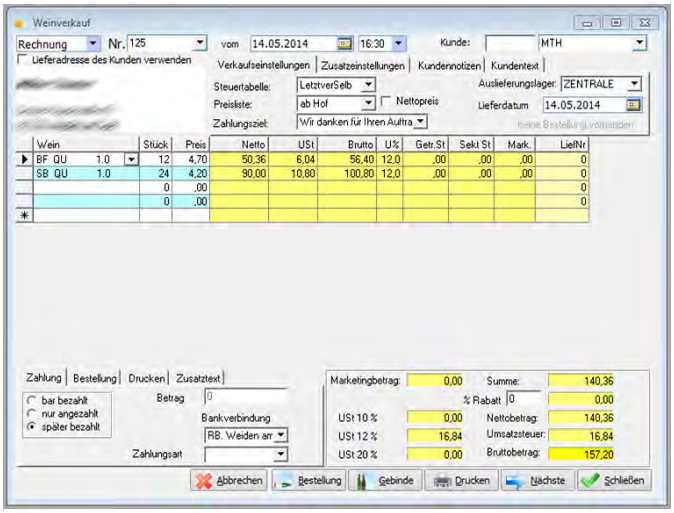

Figure B.30: Kellermanagement - create an invoice

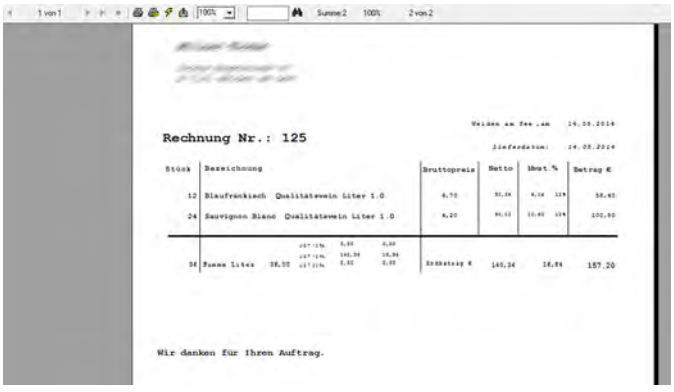

Figure B.31: Kellermanagement - printview of invoice

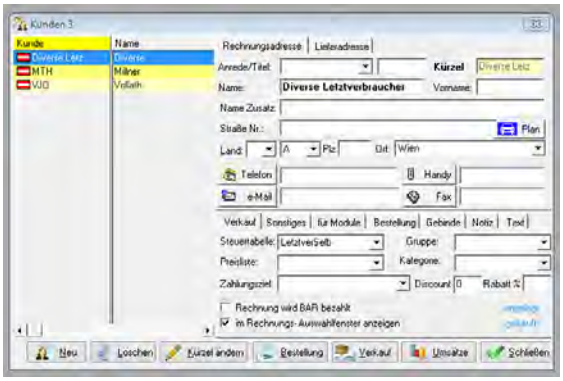

Figure B.32: Kellermanagement - list of customers

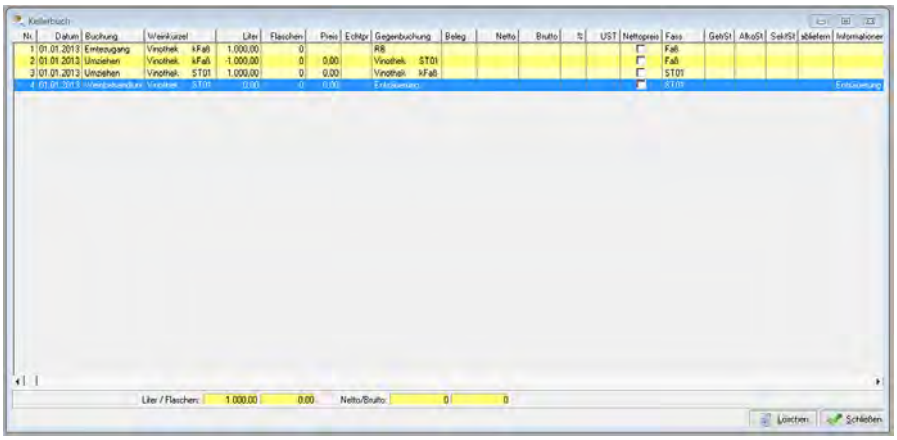

Figure B.33: Kellermanagement - Kellerbuch overview

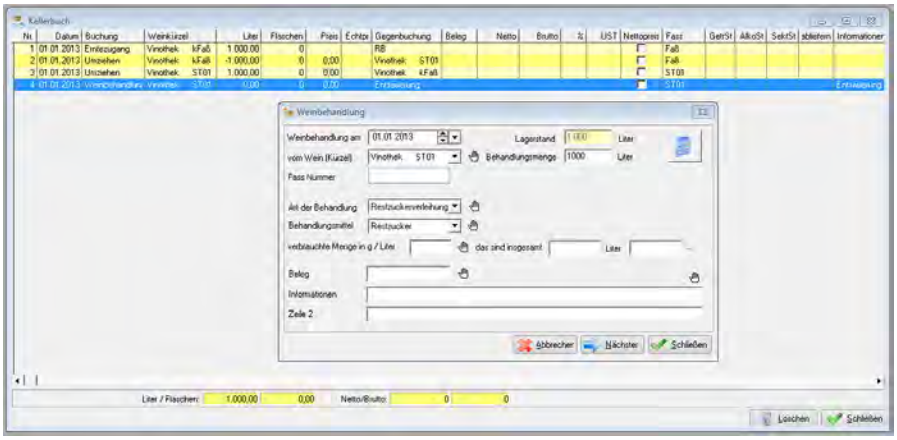

Figure B.34: Kellermanagement - add a new task to the Kellerbuch

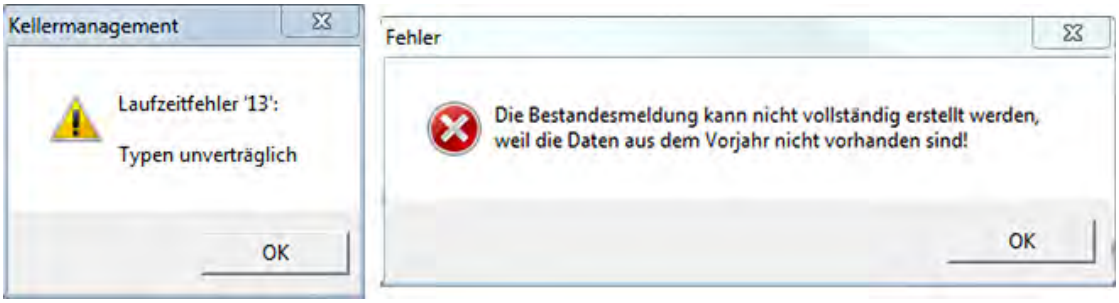

Figure B.35: Kellermanagement - error messages

B.2 Website Screenshots

The following screenshots show the look and feel of the websites in chapter 5, Winery Web Fitness. All screenshots were taken on the 3rd of June, 2014.

Figure B.36: Arocker
http://www.arocker.at

Figure B.37: Berger
http://www.bergerwein.at

Figure B.38: Dürnberg
http://www.duernberg.at

Figure B.39: Faber
http://www.faber-wein.at

Figure B.40: Schlosskellerei
http://www.schlosskellerei.at

Figure B.41: Greilinger
http://www.greilinger.at

Figure B.42: Haimer
http://www.haimer.at

Figure B.43: Katzler
http://www.weinbau-katzler.at

Figure B.44: Krottendorfer
http://www.krottendorfer.at

Figure B.45: Lehner
http://www.weingut-lehner.com

Figure B.46: Luckner
http://www.weinhof-luckner.at

Figure B.47: Minkowitsch
http://www.minkowitsch.at

Figure B.48: Neunteufl
http://www.weinbau-neunteufl.at

Figure B.49: Pass
http://www.weingut-pass.at

Figure B.50: Pointner
http://www.weingut-pointner.at

Figure B.51: Prechtl
http://www.prechtl.at

Figure B.52: Rieder
http://www.riederwein.at

Figure B.53: Scheiner
http://www.scheinerwein.at

Figure B.54: Schober
http://www.schober-wein.at

Figure B.55: Wallner
http://www.weingut-wallner.at

Figure B.56: Winkler
http://www.winklerweine.at

Figure B.57: Zuschmann
http://www.zuschmann.at

Figure B.58: Brandl
http://www.weinhof-brandl.at

Figure B.59: Diem
http://www.weinbauernhof-diem.at

Figure B.60: Epp
http://www.weingut-epp.at

Figure B.61: Gindl
http://www.weingut-gindl.at

Figure B.62: Kletzer
http://www.kletzer.at

Figure B.63: Ladentrog
http://www.ladentrog.at

Figure B.64: Schmidt
http://www.weingutschmidt.at

Figure B.65: Weingut am Berg
http://www.weingut-am-berg.at

Figure B.66: Deim
http://www.deim.at

Figure B.67: Groll
http://www.weingut-groll.at

Figure B.68: Kemetner
http://www.kemetner.at

Figure B.69: Röglsperger
http://www.roeglsperger.com

Figure B.70: Turmhof
http://www.turmhof.at

Figure B.71: Loimer
http://www.f-loimer.at

Figure B.72: Steininger
http://www.weingut-steininger.at

Figure B.73: Buchegger
http://www.buchegger.at

Figure B.74: Fink
http://www.winzerhof-fink.at

Figure B.75: Kitzler
http://www.loess.at

Figure B.76: Türk
http://www.weingutuerk.at

Figure B.77: Proidl
http://www.proidl.at

Figure B.78: Donabaum
http://www.donabaum.at

Figure B.79: Schwaiger
http://www.weingut-schwaiger.at

Figure B.80: F.X. Pichler
http://www.fx-pichler.at

Figure B.81: Müllner
http://www.winzerhof-muellner.at

Figure B.82: Siedler
http://www.weingut-siedler.at

Figure B.83: Diwald
http://www.weingut-diwald.at

Figure B.84: Kolkmann
http://www.kolkmann.at

Figure B.85: Polster
http://www.weingut-polsterer.at

Figure B.86: Ulzer
http://www.weinhof-ulzer.at

Figure B.87: Waltner
http://www.weingutwaltner.at

Figure B.88: Biegler
http://www.weingut-biegler.at

Figure B.89: Hecher
http://www.hecherwein.at

Figure B.90: Loimer
http://www.loimer.at

Figure B.91: Nigl
http://www.nigl.com

Figure B.92: Dungel
http://www.dungel.at

Figure B.93: Markowitsch
http://www.markowitsch.at

Figure B.94: Rödler
http://www.roedler.at

Figure B.95: Achs
http://www.winzerhof-achs.at

Figure B.96: Meinklang
http://www.meinklang.at

Figure B.97: Preisinger
http://www.clauspreisinger.at

Figure B.98: Friedrich
http://www.weinbau-friedrich.at

Figure B.99: Goldenits
http://www.goldenits.at

Figure B.100: Reeh
http://www.hannesreeh.at

Figure B.101: Hareter
http://www.hareter.at

Figure B.102: Kiss
http://www.weingut-kiss.at

Figure B.103: Schmelzer
http://www.schmelzer.at

Figure B.104: Steurer
http://www.hannessteurer.at

Figure B.105: Preschitz
http://www.preschitz.at

Figure B.106: Schuhmann
http://www.schuhmannsweinhof.at

Figure B.107: Zantho
http://www.zantho.com

Figure B.108: Nittnaus
http://www.nittnaus.at

Figure B.109: Holzhammer
http://www.holzhammer.at

Figure B.110: Beck
http://www.weingut-beck.at

Figure B.111: Salzl
http://www.salzl.at

Figure B.112: Bayer
http://www.bayer-erbhof.at

Figure B.113: Gut Oggau
http://www.gutoggau.com

Figure B.114: Hartl
http://www.toni-hartl.at

Figure B.115: Kloster am Spitz
http://www.klosteramspitz.at

Figure B.116: Sommer
http://www.wein-sommer.at

Figure B.117: Triebaumer
http://www.triebaumer.com

Figure B.118: Krauscher
http://www.krauscher.at

Figure B.119: Gabriel
http://www.weingut-gabriel.at

Figure B.120: Gesellmann
http://www.gesellmann.at

Figure B.121: Kirnbauer
http://www.phantom.at

Figure B.122: Lehrner
http://www.paul-lehrner.at

Figure B.123: Weninger
http://www.weninger.com

Figure B.124: Plöchl
http://www.weingut-ploechl.at

Figure B.125: Kopfensteiner
http://www.kopfensteiner.at

Figure B.126: Engel
http://www.engelweine.at

Figure B.127: Kolleritsch
http://www.kolleritsch.com

Figure B.128: Pregartner
http://www.pregartner.com

Figure B.129: Birnstingl
http://www.birnstingl.at

Figure B.130: Polz
http://www.polz.co.at

Figure B.131: Jöbstl
http://www.joebstl-weingut.at

Figure B.132: Tschermonegg
http://www.tschermonegg.at

Figure B.133: Skoff
http://www.peter-skoff.at

Figure B.134: Lazarus
http://www.weingut-lazarus.at

Figure B.135: Leopold
http://www.winzerhof-leopold.at

APPENDIX C

Source Code

C.1 WineDataXchng XML Schema Definition

```
1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <!--
4    ================================================================================
5    = WINE DATA EXCHANGE STANDARD
6    ================================================================================
7    =
8    = The WineDataXchng Standard simplifies communication between ERP Systems,
9    = internet platforms, or other applications for wineries. They can use the
10   = standard as an communication interface.
11   =
12   = @author Bernd Hareter
13   = @email e0828093@student.tuwien.ac.at
14   = @version 1.0
15   =
16   =
17   = July 2014.
18   ================================================================================
19 -->
20
21
22 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
23
24 <!--
25   ================================================================================
26   ==== ELEMENTS: Reusable Datatypes ==============================================
27   ================================================================================
28 -->
29
30 <xsd:complexType name="address">
31   <xsd:sequence>
32     <xsd:element name="country" type="xsd:string" minOccurs="0">
33       <!--
34         This should be an enumertion with ISO 3166 country codes. Because of
35         the immense length of the list, we omitted it in the Appendix.
36       -->
37     </xsd:element>
38     <xsd:element name="city" type="xsd:string" minOccurs="0" />
39     <xsd:element name="zip" type="xsd:string" minOccurs="0" />
40     <xsd:element name="street" type="xsd:string" minOccurs="0" />
41     <xsd:element name="streetnumber" type="xsd:string" minOccurs="0" />
42     <xsd:element name="phone" type="xsd:string" minOccurs="0" maxOccurs="unbounded" />
```

```
    <xsd:element name="fax" type="xsd:string" minOccurs="0" maxOccurs="unbounded" />
    <xsd:element name="mobile" type="xsd:string" minOccurs="0" maxOccurs="unbounded" />
    <xsd:element name="email" type="xsd:anyURI" minOccurs="0" maxOccurs="unbounded" />
    <xsd:element name="website" type="xsd:anyURI" minOccurs="0" maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="person">
  <xsd:sequence>
    <xsd:element name="titlePrefix" type="xsd:string" minOccurs="0" />
    <xsd:element name="firstName" type="xsd:string" minOccurs="0" />
    <xsd:element name="lastName" type="xsd:string" minOccurs="0" />
    <xsd:element name="titleSuffix" type="xsd:string" minOccurs="0" />
    <xsd:element name="country" type="xsd:string" minOccurs="0">
      <!--
        This should be an enumertion with ISO 3166 country codes. Because of
        the immense length of the list, we omitted it in the Appendix.
      -->
    </xsd:element>
    <xsd:element name="sex" minOccurs="0">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="male"/>
          <xsd:enumeration value="female"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>
    <xsd:element name="phone" type="xsd:string" minOccurs="0" maxOccurs="unbounded" />
    <xsd:element name="mobile" type="xsd:string" minOccurs="0" maxOccurs="unbounded" />
    <xsd:element name="email" type="xsd:anyURI" minOccurs="0" maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="description">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="lang" type="xsd:string" />
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>

<xsd:complexType name="unitTypeNNI">
  <xsd:simpleContent>
    <xsd:extension base="xsd:nonNegativeInteger">
      <xsd:attribute name="unit" type="xsd:string" />
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>

<xsd:complexType name="unitTypeFloat">
  <xsd:simpleContent>
    <xsd:extension base="xsd:float">
      <xsd:attribute name="unit" type="xsd:string" />
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>

<xsd:complexType name="idTypeString">
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="id" type="xsd:string" />
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>

<xsd:complexType name="socialMedia">
  <xsd:all>
    <xsd:element name="facebook" type="xsd:anyURI" minOccurs="0" />
    <xsd:element name="twitter" type="xsd:anyURI" minOccurs="0" />
    <xsd:element name="xing" type="xsd:anyURI" minOccurs="0" />
    <xsd:element name="linkedIn" type="xsd:anyURI" minOccurs="0" />
    <xsd:element name="google" type="xsd:anyURI" minOccurs="0" />
    <xsd:element name="pinterest" type="xsd:anyURI" minOccurs="0" />
```

```
116       <xsd:element name="tumblr" type="xsd:anyURI" minOccurs="0" />
117       <xsd:element name="others" minOccurs="0">
118         <xsd:complexType>
119           <xsd:sequence>
120             <xsd:element name="platform" maxOccurs="unbounded">
121               <xsd:complexType>
122                 <xsd:sequence>
123                   <xsd:element name="name" type="xsd:string" />
124                   <xsd:element name="url" type="xsd:anyURI" />
125                 </xsd:sequence>
126               </xsd:complexType>
127             </xsd:element>
128           </xsd:sequence>
129         </xsd:complexType>
130       </xsd:element>
131     </xsd:all>
132   </xsd:complexType>
133
134   <xsd:complexType name="price">
135     <xsd:sequence>
136       <xsd:element name="value" type="xsd:float" />
137       <xsd:element name="currency" type="xsd:string">
138         <!--
139           This should be an enumertion with ISO 4217 currency codes. Because
140           of the immense length of the list, we omitted it in the Appendix.
141         -->
142       </xsd:element>
143       <xsd:element name="list" type="xsd:string" default="standard" />
144       <xsd:element name="gross" type="xsd:boolean" default="false" />
145       <xsd:element name="VAT" type="xsd:float" minOccurs="0" />
146     </xsd:sequence>
147   </xsd:complexType>
148
149   <xsd:simpleType name="vatType">
150     <xsd:restriction base="xsd:string">
151       <xsd:enumeration value="oak"/>
152       <xsd:enumeration value="steel"/>
153       <xsd:enumeration value="polyester"/>
154       <xsd:enumeration value="wood"/>
155       <xsd:enumeration value="concrete"/>
156       <xsd:enumeration value="clay"/>
157     </xsd:restriction>
158   </xsd:simpleType>
159
160   <xsd:complexType name="weissRotRoseType">
161     <xsd:sequence>
162       <xsd:element name="weiss" type="xsd:float" default="0" />
163       <xsd:element name="rotRose" type="xsd:float" default="0" />
164     </xsd:sequence>
165   </xsd:complexType>
166
167   <xsd:complexType name="image">
168     <xsd:sequence>
169       <xsd:element name="type" minOccurs="0">
170         <xsd:simpleType>
171               <xsd:restriction base="xsd:string">
172           <xsd:enumeration value="thumbnail" />
173           <xsd:enumeration value="small" />
174           <xsd:enumeration value="medium" />
175           <xsd:enumeration value="normal" />
176           <xsd:enumeration value="large" />
177           <xsd:enumeration value="xlarge" />
178         </xsd:restriction>
179       </xsd:simpleType>
180       </xsd:element>
181       <xsd:element name="url" type="xsd:anyURI" minOccurs="0" />
182       <xsd:element name="embedded" minOccurs="0" maxOccurs="1">
183         <xsd:complexType>
184           <xsd:sequence>
185             <xsd:element name="imagefilename" type="xsd:string" minOccurs="0" />
186
187             <xsd:element name="imageformat" minOccurs="0">
188               <xsd:simpleType>
```

```
              <xsd:restriction base="xsd:string">
                <xsd:enumeration value="JPEG" />
                <xsd:enumeration value="GIF" />
                <xsd:enumeration value="PNG" />
                <xsd:enumeration value="TIFF" />
                <xsd:enumeration value="SVG" />
                <xsd:enumeration value="BMP" />
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:element>

          <xsd:element name="imagemode" minOccurs="0">
            <xsd:simpleType>
              <xsd:restriction base="xsd:string">
                <xsd:enumeration value="RGB" />
                <xsd:enumeration value="RGBA" />
                <xsd:enumeration value="CMYK" />
                <xsd:enumeration value="L" />
                <xsd:enumeration value="P" />
                <xsd:enumeration value="YCbCr" />
                <xsd:enumeration value="I" />
                <xsd:enumeration value="F" />
                <xsd:enumeration value="1" />
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:element>

          <xsd:element name="imagesize" minOccurs="0">
            <xsd:annotation>
              <xsd:documentation>Imagewidth and Imageheight in pixels</xsd:documentation>
            </xsd:annotation>
            <xsd:complexType>
              <xsd:sequence>
                <xsd:element name="imagewidth" type="xsd:nonNegativeInteger" minOccurs="0" />
                <xsd:element name="imageheight" type="xsd:nonNegativeInteger" minOccurs="0" />
              </xsd:sequence>
            </xsd:complexType>
          </xsd:element>

          <xsd:element name="imagedata" type="xsd:base64Binary" minOccurs="0">
            <xsd:annotation>
              <xsd:documentation>image data encoded in base64 - see RFC 2045</xsd:documentation>
            </xsd:annotation>
          </xsd:element>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>

<!--
  ============================================================================================
  ==== ELEMENT: Vineyard ======================================================================
  ============================================================================================
-->

<xsd:complexType name="vineyard">
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" />
    <xsd:element name="soil" minOccurs="0">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="basalt"/><xsd:enumeration value="chalk"/>
          <xsd:enumeration value="clay"/><xsd:enumeration value="dolomite"/>
          <xsd:enumeration value="flint"/><xsd:enumeration value="granite"/>
          <xsd:enumeration value="gravel"/><xsd:enumeration value="greywacke"/>
          <xsd:enumeration value="gypsum"/><xsd:enumeration value="hardpan"/>
          <xsd:enumeration value="keuper"/><xsd:enumeration value="lignite"/>
          <xsd:enumeration value="limestone"/><xsd:enumeration value="loam"/>
          <xsd:enumeration value="loess"/><xsd:enumeration value="marl"/>
          <xsd:enumeration value="mica"/><xsd:enumeration value="muschelkalk"/>
          <xsd:enumeration value="perlite"/><xsd:enumeration value="quartz"/>
          <xsd:enumeration value="sand"/><xsd:enumeration value="schist"/>
```

```
            <xsd:enumeration value="shale"/><xsd:enumeration value="silt"/>
            <xsd:enumeration value="silex"/><xsd:enumeration value="slate"/>
            <xsd:enumeration value="terra_rossa"/><xsd:enumeration value="tufa"/>
            <xsd:enumeration value="ultisol"/><xsd:enumeration value="volcanic_soil"/>
            <xsd:enumeration value="chernozem"/><xsd:enumeration value="other"/>
          </xsd:restriction>
        </xsd:simpleType>
      </xsd:element>
      <xsd:element name="vineyardSite" type="xsd:string" minOccurs="0" />
      <xsd:element name="trainingForm" minOccurs="0">
        <xsd:simpleType>
          <xsd:restriction base="xsd:string">
            <xsd:enumeration value="low"/>
            <xsd:enumeration value="espalier"/>
            <xsd:enumeration value="espalier_cordon"/>
            <xsd:enumeration value="espalier_segmentalArch"/>
            <xsd:enumeration value="espalier_doubleSegmentalArch"/>
            <xsd:enumeration value="espalier_semicircle"/>
            <xsd:enumeration value="espalier_pendulumArch"/>
            <xsd:enumeration value="lyre"/>
            <xsd:enumeration value="high"/>
            <xsd:enumeration value="high_cordon"/>
            <xsd:enumeration value="high_sylvoz"/>
            <xsd:enumeration value="pergola"/>
            <xsd:enumeration value="freeHanging"/>
            <xsd:enumeration value="freeHanging_vertiko"/>
            <xsd:enumeration value="freeHanging_oneWire"/>
            <xsd:enumeration value="minimal"/>
          </xsd:restriction>
        </xsd:simpleType>
      </xsd:element>
      <xsd:element name="size" type="unitTypeNNI" minOccurs="0" />
      <xsd:element name="production" type="unitTypeNNI" minOccurs="0" />

      <xsd:element name="varieties" minOccurs="0">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="variety" maxOccurs="unbounded">
              <xsd:complexType>
                <xsd:sequence>
                  <xsd:element name="name" type="xsd:string" />
                  <xsd:element name="plantdate" type="xsd:date" minOccurs="0" />
                  <xsd:element name="share" type="unitTypeNNI" minOccurs="0" />
                </xsd:sequence>
              </xsd:complexType>
            </xsd:element>
          </xsd:sequence>
        </xsd:complexType>
      </xsd:element>

      <xsd:element name="grapeHarvesterPossible" type="xsd:boolean" minOccurs="0" />
      <xsd:element name="notes" type="xsd:string" minOccurs="0" />
    </xsd:sequence>
    <xsd:attribute name="id" type="xsd:string" />
  </xsd:complexType>


  <!--
    ================================================================================
    ==== ELEMENT: Wine =============================================================
    ================================================================================
  -->

  <!-- ==== Complex Datatypes ========================================================= -->
  <xsd:complexType name="vinification">
    <xsd:sequence>
      <xsd:element name="winegrower" type="xsd:string" minOccurs="0" />
      <xsd:element name="partnerWineries" minOccurs="0">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="winery" maxOccurs="unbounded">
              <xsd:complexType>
                <xsd:sequence>
```

```
                <xsd:element name="name" type="xsd:string" minOccurs="0" />
                <xsd:element name="address" type="address" minOccurs="0" maxOccurs="unbounded" />
              </xsd:sequence>
            </xsd:complexType>
          </xsd:element>

          <xsd:element name="notes" type="xsd:string" minOccurs="0" />
        </xsd:sequence>
        <xsd:attribute name="id" type="xsd:string" />
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="cultivation" type="xsd:string" minOccurs="0" />
    <xsd:element name="harvestDate" type="xsd:date" minOccurs="0" />
    <xsd:element name="harvestAmount" type="unitTypeNNI" minOccurs="0" />

    <xsd:element name="wineType" minOccurs="0" maxOccurs="1">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="white"/>
          <xsd:enumeration value="red"/>
          <xsd:enumeration value="rose"/>
          <xsd:enumeration value="sweet"/>
          <xsd:enumeration value="sparkling"/>
          <xsd:enumeration value="champagne"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>

    <xsd:element name="wineQuality" type="xsd:string" minOccurs="0" />

    <xsd:element name="barrelaged" minOccurs="0">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="count" type="xsd:nonNegativeInteger" />
          <xsd:element name="unit">
            <xsd:simpleType>
              <xsd:restriction base="xsd:string">
                <xsd:enumeration value="days"/>
                <xsd:enumeration value="months"/>
                <xsd:enumeration value="years"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:element>
          <xsd:element name="type" type="vatType" minOccurs="1" maxOccurs="1" />
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="maturation" type="xsd:string" minOccurs="0" maxOccurs="1" />

    <xsd:element name="fermentation" minOccurs="0" maxOccurs="1">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="temperature" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="duration" type="unitTypeNNI" minOccurs="0" />
          <xsd:element name="barreltype" type="vatType" minOccurs="0" />
          <xsd:element name="notes" type="xsd:string" minOccurs="0" />
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="notes" type="xsd:string" minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

<!-- stockMovement copied from vinoxml.org -->
<xsd:complexType name="stockMovement">
  <xsd:sequence>
    <xsd:element name="date" type="xsd:date" />
    <xsd:element name="quantity" type="xsd:nonNegativeInteger" default="0" />
    <xsd:element name="unitprice" type="price" />
    <xsd:element name="notes" type="xsd:string" minOccurs="0" />
```

```
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="tradingUnits">
    <xsd:sequence>
      <xsd:element name="bottle" minOccurs="0" maxOccurs="unbounded">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="size" type="unitTypeFloat" minOccurs="0" />
            <xsd:element name="bottleTop" type="xsd:string" minOccurs="0" />
            <xsd:element name="availableOn" type="xsd:date" minOccurs="0" />
            <xsd:element name="soldOut" type="xsd:boolean" minOccurs="0" />

            <xsd:element name="price" type="price" minOccurs="0" maxOccurs="unbounded" />

            <xsd:element name="ean" minOccurs="0" maxOccurs="1">
              <xsd:complexType>
                <xsd:sequence>
                  <xsd:element name="number" type="xsd:string" />
                  <xsd:element name="type" type="xsd:string" />
                </xsd:sequence>
              </xsd:complexType>
            </xsd:element>

            <xsd:element name="bottling" minOccurs="0">
              <xsd:complexType>
                <xsd:sequence>
                  <xsd:element name="charge" maxOccurs="unbounded">
                    <xsd:complexType>
                      <xsd:sequence>
                        <xsd:element name="bottlingDate" type="xsd:date" />
                        <xsd:element name="bottlesFilled" type="xsd:nonNegativeInteger" />
                      </xsd:sequence>
                      <xsd:attribute name="id" type="xsd:string" />
                    </xsd:complexType>
                  </xsd:element>
                </xsd:sequence>
              </xsd:complexType>
            </xsd:element>

            <xsd:element name="totalStock" type="xsd:nonNegativeInteger" minOccurs="0" />
            <xsd:element name="currentStock" type="xsd:nonNegativeInteger" minOccurs="0" />

            <xsd:element name="stockMovements" minOccurs="0">
              <xsd:complexType>
                <xsd:sequence>
                  <xsd:element name="stockMovement" type="stockMovement" maxOccurs="unbounded" />
                </xsd:sequence>
              </xsd:complexType>
            </xsd:element>

            <xsd:element name="stockedIn" minOccurs="0">
              <xsd:complexType>
                <xsd:sequence>
                  <xsd:element name="location" minOccurs="0" maxOccurs="unbounded">
                    <xsd:complexType>
                      <xsd:sequence>
                        <xsd:element name="id" type="xsd:string" minOccurs="0">

                        </xsd:element>
                        <xsd:element name="name" type="xsd:string" minOccurs="0" />
                        <xsd:element name="lane" type="xsd:string" minOccurs="0" />
                        <xsd:element name="column" type="xsd:string" minOccurs="0" />
                        <xsd:element name="row" type="xsd:string" minOccurs="0" />
                        <xsd:element name="bin" type="xsd:string" minOccurs="0" />
                        <xsd:element name="containertype" type="xsd:string" minOccurs="0" />
                        <xsd:element name="quantity" type="xsd:nonNegativeInteger" minOccurs="0" />
                      </xsd:sequence>
                    </xsd:complexType>
                  </xsd:element>
                </xsd:sequence>
              </xsd:complexType>
            </xsd:element>
```

```
481
482           </xsd:sequence>
483         </xsd:complexType>
484       </xsd:element>
485       <xsd:element name="vat" minOccurs="0" maxOccurs="unbounded">
486         <xsd:complexType>
487           <xsd:sequence>
488             <xsd:element name="capacity" type="unitTypeFloat" minOccurs="0" />
489             <xsd:element name="type" type="vatType" minOccurs="0" />
490
491             <xsd:element name="openingStock" type="xsd:float" minOccurs="0" />
492             <xsd:element name="currentStock" type="xsd:float" minOccurs="0" />
493
494             <xsd:element name="location" minOccurs="0" maxOccurs="1">
495               <xsd:complexType>
496                 <xsd:sequence>
497                   <xsd:element name="id" type="xsd:string" minOccurs="0" />
498                   <xsd:element name="name" type="xsd:string" minOccurs="0" />
499                   <xsd:element name="lane" type="xsd:string" minOccurs="0" />
500                   <xsd:element name="column" type="xsd:string" minOccurs="0" />
501                   <xsd:element name="row" type="xsd:string" minOccurs="0" />
502                 </xsd:sequence>
503               </xsd:complexType>
504             </xsd:element>
505           </xsd:sequence>
506           <xsd:attribute name="id" type="xsd:string" />
507         </xsd:complexType>
508       </xsd:element>
509     </xsd:sequence>
510   </xsd:complexType>
511
512
513   <!-- ==== Wine Type ================================================================ -->
514
515   <xsd:complexType name="wine">
516     <xsd:sequence>
517       <xsd:element name="name" type="xsd:string" />
518       <xsd:element name="abbr" type="xsd:string" minOccurs="0" />
519       <xsd:element name="year" type="xsd:nonNegativeInteger" minOccurs="0" />
520       <xsd:element name="wineregion" type="xsd:string" minOccurs="0" />
521       <xsd:element name="origin" type="xsd:string" minOccurs="0" />
522       <xsd:element name="officialCertificationNumber" type="xsd:string" minOccurs="0" />
523
524       <xsd:element name="varieties" minOccurs="0" maxOccurs="1">
525         <xsd:complexType>
526           <xsd:sequence>
527             <xsd:element name="variety" minOccurs="1" maxOccurs="unbounded">
528               <xsd:complexType>
529                 <xsd:sequence>
530                   <xsd:element name="abbr" type="xsd:string" minOccurs="0" />
531                   <xsd:element name="name" type="xsd:string" minOccurs="0" />
532                   <xsd:element name="percentage" type="xsd:nonNegativeInteger" minOccurs="0" />
533                   <xsd:element name="vineyard" type="idTypeString" minOccurs="0" />
534                 </xsd:sequence>
535               </xsd:complexType>
536             </xsd:element>
537           </xsd:sequence>
538         </xsd:complexType>
539       </xsd:element>
540
541       <xsd:element name="shortDesc" type="description" minOccurs="0" maxOccurs="unbounded" />
542       <xsd:element name="description" type="description" minOccurs="0" maxOccurs="unbounded" />
543       <xsd:element name="vinification" type="vinification" minOccurs="0" />
544
545       <xsd:element name="analysesData" minOccurs="0">
546         <xsd:complexType>
547           <xsd:sequence>
548             <xsd:element name="alcohol" type="unitTypeFloat" minOccurs="0" />
549
550             <xsd:element name="gradation">
551               <xsd:complexType>
552                 <xsd:sequence>
553                   <xsd:element name="type" type="xsd:string" minOccurs="0" />
```

```
                <xsd:element name="value" type="xsd:string" minOccurs="0" />
              </xsd:sequence>
            </xsd:complexType>
          </xsd:element>

          <xsd:element name="sugar" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="sugarfreeExtract" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="acidity" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="titratableAcidity" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="volatileAcidity" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="sulphur" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="totalSulphur" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="specificGravity" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="totalPhosphor" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="gluconicAcid" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="malicAcid" type="unitTypeFloat" minOccurs="0" />
          <xsd:element name="notes" type="xsd:string" minOccurs="0" />
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="drinkingDetails" minOccurs="0" maxOccurs="1">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="temperature" minOccurs="0" maxOccurs="1">
            <xsd:complexType>
              <xsd:sequence>
                <xsd:element name="from" type="xsd:float" />
                <xsd:element name="to" type="xsd:float" />
              </xsd:sequence>
              <xsd:attribute name="unit">
                <xsd:simpleType>
                  <xsd:restriction base="xsd:string">
                    <xsd:enumeration value="celsius"/>
                    <xsd:enumeration value="farenheit"/>
                  </xsd:restriction>
                </xsd:simpleType>
              </xsd:attribute>
            </xsd:complexType>
          </xsd:element>
          <xsd:element name="agingAbility" minOccurs="0" maxOccurs="1">
            <xsd:complexType>
              <xsd:sequence>
                <xsd:element name="from" type="xsd:nonNegativeInteger" />
                <xsd:element name="to" type="xsd:nonNegativeInteger" />
              </xsd:sequence>
            </xsd:complexType>
          </xsd:element>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="flavours" minOccurs="0" maxOccurs="1">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="flavour" type="xsd:string" maxOccurs="unbounded" />
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="dishes" minOccurs="0" maxOccurs="1">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="dish" type="xsd:string" maxOccurs="unbounded" />
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="qualitySeal" type="xsd:string" minOccurs="0" maxOccurs="1" />

    <xsd:element name="awards" minOccurs="0" maxOccurs="1">
      <xsd:complexType>
        <xsd:sequence>
```

```
627             <xsd:element name="award" maxOccurs="unbounded">
628               <xsd:complexType>
629                 <xsd:sequence>
630                   <xsd:element name="name" type="xsd:string" />
631                   <xsd:element name="description" type="xsd:string" minOccurs="0" />
632                   <xsd:element name="scoreType" type="xsd:string" minOccurs="0" />
633                   <xsd:element name="minScore" type="xsd:string" minOccurs="0" />
634                   <xsd:element name="maxScore" type="xsd:string" minOccurs="0" />
635                   <xsd:element name="score" type="xsd:string" minOccurs="0" />
636                   <xsd:element name="prize" type="xsd:string" minOccurs="0" />
637                   <xsd:element name="additionalInformation" type="xsd:string" minOccurs="0" />
638                   <xsd:element name="awardDate" type="xsd:date" minOccurs="0" />
639                   <xsd:element name="publisher" type="xsd:string" minOccurs="0" />
640                   <xsd:element name="publishedIn" type="xsd:string" minOccurs="0" maxOccurs="unbounded" />
641                 </xsd:sequence>
642               </xsd:complexType>
643             </xsd:element>
644           </xsd:sequence>
645         </xsd:complexType>
646       </xsd:element>
647
648       <xsd:element name="stock" minOccurs="0" maxOccurs="1">
649         <xsd:complexType>
650           <xsd:sequence>
651             <xsd:element name="unit" type="xsd:string" minOccurs="0" />
652             <xsd:element name="openingStock" type="xsd:string" minOccurs="0" />
653             <xsd:element name="currentStock" type="xsd:string" minOccurs="0" />
654             <xsd:element name="tradingUnits" type="tradingUnits" minOccurs="0" />
655           </xsd:sequence>
656         </xsd:complexType>
657       </xsd:element>
658
659       <xsd:element name="image" type="image" minOccurs="0" maxOccurs="unbounded" />
660       <xsd:element name="notes" type="xsd:string" minOccurs="0" maxOccurs="1" />
661     </xsd:sequence>
662     <xsd:attribute name="id" type="xsd:string" />
663   </xsd:complexType>
664
665
666   <!--
667     ========================================================================================
668     ==== ELEMENT: Warehouse ================================================================
669     ========================================================================================
670   -->
671
672   <!-- ==== Complex Datatypes ============================================================ -->
673
674   <xsd:complexType name="warehouseWine">
675     <xsd:sequence>
676       <xsd:element name="id" type="xsd:string" />
677       <xsd:element name="bottle" minOccurs="1" maxOccurs="unbounded">
678         <xsd:complexType>
679           <xsd:sequence>
680             <xsd:element name="size" type="unitTypeFloat" minOccurs="0" />
681             <xsd:element name="totalQuantity" type="xsd:nonNegativeInteger" />
682
683             <xsd:element name="location" minOccurs="0" maxOccurs="unbounded">
684               <xsd:complexType>
685                 <xsd:sequence>
686                   <xsd:element name="lane" type="xsd:string" minOccurs="0" />
687                   <xsd:element name="column" type="xsd:string" minOccurs="0" />
688                   <xsd:element name="row" type="xsd:string" minOccurs="0" />
689                   <xsd:element name="bin" type="xsd:string" minOccurs="0" />
690                   <xsd:element name="containertype" type="xsd:string" minOccurs="0" />
691                   <xsd:element name="quantity" type="xsd:nonNegativeInteger" minOccurs="0" />
692                 </xsd:sequence>
693               </xsd:complexType>
694             </xsd:element>
695           </xsd:sequence>
696         </xsd:complexType>
697       </xsd:element>
698
699       <xsd:element name="vat" minOccurs="0" maxOccurs="unbounded">
```

```
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="id" type="xsd:string" />
          <xsd:element name="quantity" type="unitTypeFloat" minOccurs="0" />

          <xsd:element name="location" minOccurs="0" maxOccurs="1">
            <xsd:complexType>
              <xsd:sequence>
                <xsd:element name="lane" type="xsd:string" minOccurs="0" />
                <xsd:element name="column" type="xsd:string" minOccurs="0" />
                <xsd:element name="row" type="xsd:string" minOccurs="0" />
              </xsd:sequence>
            </xsd:complexType>
          </xsd:element>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>


<!-- ==== Warehouse Type ========================================================== -->

<xsd:complexType name="warehouse">
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="1" maxOccurs="1" />
    <xsd:element name="address" type="address" minOccurs="1" maxOccurs="1" />

    <xsd:element name="vats" minOccurs="0" maxOccurs="1">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="vat" minOccurs="1" maxOccurs="unbounded">
            <xsd:complexType>
              <xsd:sequence>
                <xsd:element name="name" type="xsd:string" minOccurs="0" />
                <xsd:element name="capacity" type="unitTypeFloat" minOccurs="1" />
                <xsd:element name="type" type="vatType" minOccurs="0" />

                <xsd:element name="location" minOccurs="0">
                  <xsd:complexType>
                    <xsd:sequence>
                      <xsd:element name="lane" type="xsd:string" minOccurs="0" />
                      <xsd:element name="column" type="xsd:string" minOccurs="0" />
                      <xsd:element name="row" type="xsd:string" minOccurs="0" />
                    </xsd:sequence>
                  </xsd:complexType>
                </xsd:element>
              </xsd:sequence>
              <xsd:attribute name="id" type="xsd:string" />
            </xsd:complexType>
          </xsd:element>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="stock" minOccurs="0" maxOccurs="1">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="wine" type="warehouseWine" maxOccurs="unbounded" />
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:string" />
</xsd:complexType>


<!--
  ============================================================================================
  ==== ELEMENT: Administrative Reports ========================================================
  ============================================================================================
-->
```

```
773
774 <!-- ==== Complex Datatypes ========================================================== -->
775
776 <xsd:complexType name="bestWein">
777   <xsd:sequence>
778     <xsd:element name="wein" type="weissRotRoseType" />
779     <xsd:element name="weinMitSorte" type="weissRotRoseType" />
780     <xsd:element name="landwein" type="weissRotRoseType" />
781     <xsd:element name="qualitaetswein" type="weissRotRoseType" />
782     <xsd:element name="praedikatswein" type="weissRotRoseType" />
783     <xsd:element name="schaumwein_sonstige" type="weissRotRoseType" />
784     <xsd:element name="erzeugnisseEU" type="weissRotRoseType" />
785     <xsd:element name="EUverschnitt" type="weissRotRoseType" />
786     <xsd:element name="weinDrittlaender" type="weissRotRoseType" />
787   </xsd:sequence>
788 </xsd:complexType>
789
790
791 <!-- ==== Administrative Reports Type AUT ============================================ -->
792
793 <xsd:complexType name="AUT">
794   <xsd:sequence>
795     <xsd:element name="erntemeldung" type="erntemeldung" minOccurs="0" maxOccurs="unbounded" />
796     <xsd:element name="bestandsmeldung" type="bestandsmeldung" minOccurs="0" maxOccurs="unbounded" />
797   </xsd:sequence>
798 </xsd:complexType>
799
800 <xsd:complexType name="erntemeldung">
801   <xsd:sequence>
802     <xsd:element name="stichtag" type="xsd:date" />
803
804     <xsd:choice>
805       <xsd:element name="leermeldung" type="xsd:boolean" fixed="true" />
806
807       <xsd:sequence>
808         <xsd:element name="ernte">
809           <xsd:complexType>
810             <xsd:sequence>
811               <xsd:element name="traubensorte" maxOccurs="unbounded">
812                 <xsd:complexType>
813                   <xsd:sequence>
814                     <xsd:element name="name" type="xsd:string" maxOccurs="3" />
815                     <xsd:element name="qualitaet" type="xsd:string" />
816                     <xsd:element name="eingefuellterWein" type="xsd:float" minOccurs="0" default="0" />
817                     <xsd:element name="verkaufteTrauben" type="xsd:float" minOccurs="0" default="0" />
818                   </xsd:sequence>
819                 </xsd:complexType>
820               </xsd:element>
821             </xsd:sequence>
822           </xsd:complexType>
823         </xsd:element>
824
825         <xsd:element name="flaeche">
826           <xsd:complexType>
827             <xsd:sequence>
828               <xsd:element name="wertigerWein">
829                 <xsd:complexType>
830                   <xsd:sequence>
831                     <xsd:element name="ha" type="xsd:float" default="0" />
832                     <xsd:element name="weiss" type="xsd:float" default="0" />
833                     <xsd:element name="rotRose" type="xsd:float" default="0" />
834                   </xsd:sequence>
835                 </xsd:complexType>
836               </xsd:element>
837               <xsd:element name="wein">
838                 <xsd:complexType>
839                   <xsd:sequence>
840                     <xsd:element name="ha" type="xsd:float" default="0" />
841                     <xsd:element name="weiss" type="xsd:float" default="0" />
842                     <xsd:element name="rotRose" type="xsd:float" default="0" />
843                   </xsd:sequence>
844                 </xsd:complexType>
845               </xsd:element>
```

```
              <xsd:element name="sonstigeErzeugnisse">
                <xsd:complexType>
                  <xsd:sequence>
                    <xsd:element name="ha" type="xsd:float" default="0" />
                    <xsd:element name="weiss" type="xsd:float" default="0" />
                    <xsd:element name="rotRose" type="xsd:float" default="0" />
                  </xsd:sequence>
                </xsd:complexType>
              </xsd:element>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>

        <xsd:element name="beabsichtigteSuessung" type="xsd:boolean" default="false" />
        <xsd:element name="beabsichtigteEntsaeuerung" type="xsd:boolean" default="false" />
        <xsd:element name="abgabedatum" type="xsd:date" />
      </xsd:sequence>
    </xsd:choice>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="bestandsmeldung">
  <xsd:sequence>
    <xsd:element name="stichtag" type="xsd:date" />

    <xsd:choice>
      <xsd:element name="leermeldung" type="xsd:boolean" fixed="true" />

      <xsd:sequence>
        <xsd:element name="bestand">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="zugang" minOccurs="0">
                <xsd:complexType>
                  <xsd:sequence>
                    <xsd:element name="ernte_fasszukauf" type="bestWein" minOccurs="0" />
                    <xsd:element name="flaschenzukauf" type="bestWein" minOccurs="0" />
                    <xsd:element name="abgewerteterWein" type="bestWein" minOccurs="0" />
                  </xsd:sequence>
                </xsd:complexType>
              </xsd:element>

              <xsd:element name="abgang" minOccurs="0">
                <xsd:complexType>
                  <xsd:sequence>
                    <xsd:element name="fassverkauf" type="bestWein" minOccurs="0" />
                    <xsd:element name="flaschenverkauf" type="bestWein" minOccurs="0" />
                    <xsd:element name="abgewerteterWein" type="bestWein" minOccurs="0" />
                    <xsd:element name="eigenverbrauch_schwund" type="bestWein" minOccurs="0" />
                  </xsd:sequence>
                </xsd:complexType>
              </xsd:element>

              <xsd:element name="traubenmost" minOccurs="0">
                <xsd:complexType>
                  <xsd:sequence>
                    <xsd:element name="konzentrierterTraubenmost" type="weissRotRoseType" />
                    <xsd:element name="rektifizierterKonzTraubenmost" type="weissRotRoseType" />
                  </xsd:sequence>
                </xsd:complexType>
              </xsd:element>

              <xsd:element name="beabsichtigteAnreicherung" type="xsd:boolean" default="false" />
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>

        <xsd:element name="abgabedatum" type="xsd:date" />
      </xsd:sequence>
    </xsd:choice>
  </xsd:sequence>
</xsd:complexType>
```

```
<!--
  ================================================================================
  ==== ROOT: WineDataXchng ======================================================
  ================================================================================
-->

<xsd:element name="wineries">
  <xsd:complexType>
  <xsd:sequence>
  <xsd:element name="winery" minOccurs="1" maxOccurs="unbounded">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="linkTo" type="xsd:string" minOccurs="0" />
        <xsd:element name="name" type="xsd:string" minOccurs="0" />
        <xsd:element name="shortcut" type="xsd:string" minOccurs="0" />
        <xsd:element name="wineryno" type="xsd:string" minOccurs="0" />
        <xsd:element name="legalStructure" type="xsd:string" minOccurs="0" />
        <xsd:element name="taxID" type="xsd:string" minOccurs="0" />
        <xsd:element name="vatID" type="xsd:string" minOccurs="0" />

        <xsd:element name="address" type="address" minOccurs="0" maxOccurs="unbounded" />

        <xsd:element name="contact" minOccurs="0" maxOccurs="1">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="person" type="person" maxOccurs="unbounded" />
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>

        <xsd:element name="wineregion" type="xsd:string" minOccurs="0" />
        <xsd:element name="country" type="xsd:string" minOccurs="0" />
        <xsd:element name="wineryType" type="xsd:string" minOccurs="0" />
        <xsd:element name="winerySize" type="unitTypeNNI" minOccurs="0" />
        <xsd:element name="bottlesPerYear" type="xsd:nonNegativeInteger" minOccurs="0" />
        <xsd:element name="shortDesc" type="description" minOccurs="0" maxOccurs="unbounded" />
        <xsd:element name="description" type="description" minOccurs="0" maxOccurs="unbounded" />

        <xsd:element name="socialMedia" type="socialMedia" minOccurs="0" />
        <xsd:element name="termsAndConditions" type="xsd:string" minOccurs="0" />

        <xsd:element name="vineyards" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="vineyard" type="vineyard" maxOccurs="unbounded" />
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>

        <xsd:element name="wines" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="wine" type="wine" maxOccurs="unbounded" />
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>

        <xsd:element name="warehouses" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="warehouse" type="warehouse" maxOccurs="unbounded" />
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>

        <xsd:element name="administrativeReports" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="AUT" type="AUT" minOccurs="0" />
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
```

```
992         </xsd:sequence>
993         <xsd:attribute name="id" type="xsd:string" />
994       </xsd:complexType>
995       <xsd:key name="warehouseId">
996         <xsd:selector xpath="warehouses/warehouse"/>
997         <xsd:field xpath="@id"/>
998       </xsd:key>
999       <xsd:keyref name="StockedInToWarehouseId" refer="warehouseId">
1000        <xsd:selector xpath="wines/wine/stock/tradingUnits/bottle/stockedIn/location|
1001                    wines/wine/stock/tradingUnits/vat/location"        />
1002        <xsd:field xpath="id"/>
1003      </xsd:keyref>
1004      <xsd:key name="wineId">
1005        <xsd:selector xpath="wines/wine"/>
1006        <xsd:field xpath="@id"/>
1007      </xsd:key>
1008      <xsd:keyref name="WarehouseStockToWineId" refer="wineId">
1009        <xsd:selector xpath="warehouses/warehouse/stock/wine"/>
1010        <xsd:field xpath="id"/>
1011      </xsd:keyref>
1012      <xsd:key name="vineyardId">
1013        <xsd:selector xpath="vineyards/vineyard"/>
1014        <xsd:field xpath="@id"/>
1015      </xsd:key>
1016      <xsd:keyref name="WineVarietyVineyardToVineyardId" refer="vineyardId">
1017        <xsd:selector xpath="wines/wine/varieties/variety/vineyard"/>
1018        <xsd:field xpath="@id"/>
1019      </xsd:keyref>
1020    </xsd:element>
1021    </xsd:sequence>
1022    </xsd:complexType>
1023    <xsd:key name="wineryId">
1024      <xsd:selector xpath="winery"/>
1025      <xsd:field xpath="@id"/>
1026    </xsd:key>
1027    <xsd:keyref name="WineryLinkToWineryId" refer="wineryId">
1028      <xsd:selector xpath="winery"/>
1029      <xsd:field xpath="linkTo"/>
1030    </xsd:keyref>
1031  </xsd:element>
1032
1033  </xsd:schema>
1034
1035  <!-- ========================== END OF SCHEMA DEFINITION ============================== -->
```

Source code C.1: XML Schema definition for the Wine Data Exchange format.

C.2 WineDataXchng Working Example

```
<!--
  ============================================================================================
  = WINE DATA EXCHANGE EXAMPLE
  ============================================================================================
  =
  = Full working example for the WineDataXchng-Standard.
  =
  = @author Bernd Hareter
  = @email e0828093@student.tuwien.ac.at
  =
  = July 2014.
  ============================================================================================
-->

<wineries>
  <winery id="wghhol">
    <!-- <linkTo>otherWineryID</linkTo> -->
    <name>Weingut Hugo Holunder</name>
    <shortcut>WGHHOL</shortcut>
    <wineryno>1234567</wineryno>
    <legalStructure>KG</legalStructure>
    <taxID>345 653423 234</taxID>
    <vatID>523 243553 134</vatID>

    <address>
      <country>AUT</country>
      <city>Feldstadt</city>
      <zip>3452</zip>
      <street>Baumstra e</street>
      <streetnumber>23</streetnumber>
      <phone>+43 4562 60453</phone>
      <fax>+43 4562 60453</fax>
      <mobile>+43 664 3547723</mobile>
      <email>weingut@hugoholunder.at</email>
      <website>http://www.hugoholunder.at</website>
    </address>

    <contact>
      <person>
        <titlePrefix>Ing.</titlePrefix>
        <firstName>Hugo</firstName>
        <lastName>Holunder</lastName>
        <titleSuffix>BSc.</titleSuffix>
        <country>AUT</country>
        <sex>male</sex>
        <phone>+43 4562 60453</phone>
        <mobile>+43 664 3547723</mobile>
        <email>hugo@hugoholunder.at</email>
      </person>
      <person>
        <firstName>Martha</firstName>
        <lastName>Holunder</lastName>
        <country>AUT</country>
        <sex>female</sex>
        <phone>+43 4562 60453</phone>
        <mobile>+43 664 3547724</mobile>
        <email>martha@hugoholunder.at</email>
      </person>
    </contact>

    <wineregion>Neusiedlersee</wineregion>
    <country>AUT</country>
    <wineryType>Biodynamisch</wineryType>
    <winerySize unit="ha">8</winerySize>
    <bottlesPerYear>50000</bottlesPerYear>

    <shortDesc lang="DE">
      Das Weingut Holunder ist wundersch n.
    </shortDesc>
```

```
70
71      <description lang="DE">
72        Das, sich in Feldstadt befindliche, Weingut Hugo Holunder  berzeugt  durch
73        gute verarbeitung und hervorragende Weine in wundersch ner Umgebung.
74      </description>
75
76      <socialMedia>
77        <facebook>www.facebook.com/weinguthugoholunder</facebook>
78        <twitter>www.twitter.com/weinguthugoholunder</twitter>
79        <others>
80          <platform>
81            <name>Unser Wein</name>
82            <url>www.unserwein.at/weinguthugoholunder</url>
83          </platform>
84        </others>
85      </socialMedia>
86
87      <termsAndConditions>
88        1. Wein ist wertvoll.
89        2. Darum mit bedacht trinken.
90        3. Flaschen bleiben bis zur
91        4. vollst ndigen Bezahlung in unserem Eigentum
92      </termsAndConditions>
93
94      <vineyards>
95        <vineyard id="vineyard01">
96          <name>Rosenberg</name>
97          <soil>sand</soil>
98          <vineyardSite>Hanglage</vineyardSite>
99          <trainingForm>high</trainingForm>
100         <size unit="are">80</size>
101         <production unit="hl">80</production>
102         <varieties>
103           <variety>
104             <name>Chardonnay</name>
105             <plantdate>1990-01-01</plantdate>
106             <share unit="percentage">50</share>
107           </variety>
108           <variety>
109             <name>Welschriesling</name>
110             <plantdate>1992-01-01</plantdate>
111             <share unit="percentage">50</share>
112           </variety>
113         </varieties>
114
115         <grapeHarvesterPossible>true</grapeHarvesterPossible>
116         <notes>
117           1992 wurde der Nachbargrund gekauft und
118           Welschriesling ausgesetzt.
119         </notes>
120       </vineyard>
121       <vineyard id="vineyard02">
122         <name>Salzberg</name>
123         <soil>chalk</soil>
124         <size unit="are">50</size>
125         <production unit="hl">50</production>
126         <varieties>
127           <variety>
128             <name>Merlot</name>
129             <plantdate>2002-01-01</plantdate>
130             <share unit="percentage">100</share>
131           </variety>
132         </varieties>
133         <grapeHarvesterPossible>false</grapeHarvesterPossible>
134       </vineyard>
135     </vineyards>
136
137     <wines>
138       <wine id="wine01">
139         <name>Chardonnay</name>
140         <year>2013</year>
141         <wineregion>Neusiedlersee</wineregion>
142         <origin>WLBL</origin>
```

```
143         <officialCertificationNumber>E 1923/14</officialCertificationNumber>
144
145         <varieties>
146           <variety>
147             <abbr>CH</abbr>
148             <name>Chardonnay</name>
149             <percentage>30</percentage>
150             <vineyard id="vineyard01">Rosenberg</vineyard>
151           </variety>
152         </varieties>
153
154         <shortDesc lang="DE">
155           Guter Wein.
156         </shortDesc>
157
158         <description lang="DE">
159           Sehr guter Wein
160         </description>
161
162         <vinification>
163           <winegrower>Hugo Holunder</winegrower>
164
165           <!--
166           <partnerWineries>
167             <winery id="wgfzwe">
168               <name>Fritz Zweigelt</name>
169             </winery>
170
171             <notes>Some notes</notes>
172           </partnerWineries>
173           -->
174
175           <cultivation>konventionell</cultivation>
176           <harvestDate>2013-09-10</harvestDate>
177           <harvestAmount unit="kg">7000</harvestAmount>
178           <wineType>white</wineType>
179           <wineQuality>Qualitätswein</wineQuality>
180           <barrelaged>
181             <count>4</count>
182             <unit>months</unit>
183             <type>steel</type>
184           </barrelaged>
185
186           <!-- <maturation>  </maturation> -->
187
188           <fermentation>
189             <temperature unit="celsius">17.5</temperature>
190             <duration unit="days">10</duration>
191             <barreltype>steel</barreltype>
192
193             <notes>Langsame kalte Vergärung.</notes>
194           </fermentation>
195
196           <!-- <notes>   </notes> -->
197         </vinification>
198
199         <analysesData>
200           <alcohol unit="Vol%">12.5</alcohol>
201           <gradation>
202             <type>KMW</type>
203             <value>18</value>
204           </gradation>
205           <sugar unit="g/l">4</sugar>
206           <sugarfreeExtract unit="g/l">4</sugarfreeExtract>
207           <acidity unit="g/l">6</acidity>
208           <titratableAcidity unit="g/l">0</titratableAcidity>
209           <volatileAcidity unit="g/l">0</volatileAcidity>
210           <sulphur unit="mg/l">45</sulphur>
211           <totalSulphur unit="mg/l">95</totalSulphur>
212           <!-- <specificGravity unit=""></specificGravity> -->
213           <totalPhosphor unit="g/l">0</totalPhosphor>
214           <gluconicAcid unit="g/l">0</gluconicAcid>
215           <malicAcid unit="g/l">0</malicAcid>
```

```
216
217             <notes>Extrem gute Werte.</notes>
218           </analysesData>
219
220           <drinkingDetails>
221             <temperature unit="celsius">
222               <from>12</from>
223               <to>15</to>
224             </temperature>
225             <agingAbility>
226               <from>2014</from>
227               <to>2015</to>
228             </agingAbility>
229           </drinkingDetails>
230
231           <flavours>
232             <flavour>Banana</flavour>
233             <flavour>Apple</flavour>
234             <flavour>Pear</flavour>
235           </flavours>
236
237           <dishes>
238             <dish>Fish</dish>
239             <dish>Steak</dish>
240           </dishes>
241
242           <qualitySeal>Kremstal DAC</qualitySeal>
243
244           <awards>
245             <award>
246               <name>AWC Vienna</name>
247               <description></description>
248               <scoreType>Points</scoreType>
249               <minScore>0</minScore>
250               <maxScore>100</maxScore>
251               <score>88</score>
252               <prize>AWC Silver</prize>
253               <additionalInformation>Best Buy 2014</additionalInformation>
254               <awardDate>2014-06-06</awardDate>
255               <publisher>Hubert Huber</publisher>
256               <publishedIn>AWC Vienna Journal 07/2014</publishedIn>
257             </award>
258           </awards>
259
260           <stock>
261             <unit>l</unit>
262             <openingStock>5000</openingStock>
263             <currentStock>2375</currentStock>
264
265             <tradingUnits>
266               <bottle>
267                 <size unit="ml">750</size>
268                 <bottleTop>Screwcap</bottleTop>
269                 <availableOn>2014-02-15</availableOn>
270                 <soldOut>false</soldOut>
271                 <price>
272                   <value>5.90</value>
273                   <currency>EUR</currency>
274                   <list>Standard</list>
275                   <gross>true</gross>
276                   <VAT>20.0</VAT>
277                 </price>
278                 <ean>
279                   <number>1234567890123</number>
280                   <type>EAN-13</type>
281                 </ean>
282                 <bottling>
283                   <charge id="chardch75001">
284                     <bottlingDate>2014-02-10</bottlingDate>
285                     <bottlesFilled>1500</bottlesFilled>
286                   </charge>
287                   <charge id="chardch75002">
288                     <bottlingDate>2014-06-20</bottlingDate>
```

```
                    <bottlesFilled>1500</bottlesFilled>
                  </charge>
                </bottling>
                <totalStock>3000</totalStock>
                <currentStock>1500</currentStock>

                <stockMovements>
                  <stockMovement>
                    <date>2014-03-06</date>
                    <quantity>6</quantity>
                    <unitprice>
                      <value>5.90</value>
                      <currency>EUR</currency>
                      <list>Standard</list>
                      <gross>true</gross>
                      <VAT>20.0</VAT>
                    </unitprice>
                    <notes>Notizen</notes>
                  </stockMovement>
                </stockMovements>

                <stockedIn>
                  <location>
                    <id>wh01</id>
                    <name>Warehouse 1</name>
                    <lane>3</lane>
                    <column>2</column>
                    <row>1</row>
                    <bin>301</bin>
                    <containertype>carton</containertype>
                    <quantity>700</quantity>
                  </location>
                  <location>
                    <id>wh02</id>
                    <name>Warehouse 2</name>
                    <lane>3</lane>
                    <column>2</column>
                    <row>2</row>
                    <bin>102</bin>
                    <containertype>palett</containertype>
                    <quantity>800</quantity>
                  </location>
                </stockedIn>
              </bottle>
              <bottle>
                <size unit="ml">375</size>
                <bottleTop>Screwcap</bottleTop>
                <price>
                  <value>4.20</value>
                  <currency>EUR</currency>
                  <list>Standard</list>
                  <gross>true</gross>
                  <VAT>20.0</VAT>
                </price>
                <ean>
                  <number>1234567890124</number>
                  <type>EAN-13</type>
                </ean>
                <bottling>
                  <charge id="charch37501">
                    <bottlingDate>2014-02-10</bottlingDate>
                    <bottlesFilled>1000</bottlesFilled>
                  </charge>
                </bottling>
                <totalStock>1000</totalStock>
                <currentStock>900</currentStock>
                <stockedIn>
                  <location>
                    <id>wh01</id>
                    <name>Warehouse 1</name>
                    <lane>2</lane>
                    <column>3</column>
                    <row>1</row>
```

```
                    <bin>201</bin>
                    <containertype>palett</containertype>
                    <quantity>900</quantity>
                  </location>
                </stockedIn>
              </bottle>
              <vat id="vat01">
                <capacity unit="l">5000</capacity>
                <type>steel</type>
                <openingStock>5000</openingStock>
                <currentStock>2375</currentStock>
                <location>
                  <id>wh01</id>
                  <name>Warehouse 1</name>
                  <lane>1</lane>
                  <column>2</column>
                  <row>1</row>
                </location>
              </vat>
            </tradingUnits>
          </stock>

          <image>
            <url>http://www.hugoholunder.at/wines/white/chardonnay13.jpg</url>
            <!--
            <embedded>
              <imagefilename></imagefilename>
              <imageformat></imageformat>
              <imagemode></imagemode>
              <imagesize>
                <imagewidth></imagewidth>
                <imageheight></imageheight>
              </imagesize>
              <imagedata></imagedata>
            </embedded>
            -->
          </image>

          <notes>
            Keine Notizen in diesem Fall.
          </notes>
        </wine>
      </wines>

      <warehouses>
        <warehouse id="wh01">
          <name>Warehouse 1</name>
          <address>
            <country>AUT</country>
            <city>Feldstadt</city>
            <zip>3452</zip>
            <street>Baumstra e</street>
            <streetnumber>23</streetnumber>
            <phone>+43 4562 60453</phone>
            <fax>+43 4562 60453</fax>
            <mobile>+43 664 3547723</mobile>
          </address>

          <vats>
            <vat id="vat01">
              <name>Vat5001</name>
              <capacity unit="l">5000</capacity>
              <type>steel</type>
              <location>
                <lane>1</lane>
                <column>2</column>
                <row>1</row>
              </location>
            </vat>
            <vat id="vat02">
              <name>Vat5002</name>
              <capacity unit="l">5000</capacity>
              <type>steel</type>
```

```
            <location>
              <lane>1</lane>
              <column>3</column>
              <row>1</row>
            </location>
          </vat>
          <vat id="vat03">
            <capacity unit="l">10000</capacity>
            <type>steel</type>
            <location>
              <lane>1</lane>
              <column>4</column>
              <row>1</row>
            </location>
          </vat>
        </vats>

        <stock>
          <wine>
            <id>wine01</id>
            <bottle>
              <size unit="ml">750</size>
              <totalQuantity>700</totalQuantity>
              <location>
                <lane>2</lane>
                <column>3</column>
                <row>1</row>
                <bin>450</bin>
                <containertype>carton</containertype>
                <quantity>400</quantity>
              </location>
              <location>
                <lane>2</lane>
                <column>3</column>
                <row>2</row>
                <bin>451</bin>
                <containertype>palett</containertype>
                <quantity>300</quantity>
              </location>
            </bottle>
            <bottle>
              <size unit="ml">375</size>
              <totalQuantity>900</totalQuantity>
              <location>
                <lane>2</lane>
                <column>5</column>
                <row>2</row>
                <bin>500</bin>
                <containertype>palett</containertype>
                <quantity>900</quantity>
              </location>
            </bottle>
          </wine>
        </stock>
      </warehouse>
      <warehouse id="wh02">
        <name>Warehouse 2</name>
        <address>
          <country>AUT</country>
          <city>Ackerstadt</city>
          <zip>3461</zip>
          <street>Feldweg</street>
          <streetnumber>13</streetnumber>
          <phone>+43 4565 70546</phone>
          <fax>+43 4565 705461</fax>
          <mobile>+43 664 3547724</mobile>
        </address>
      </warehouse>
    </warehouses>
  </winery>
</wineries>
```

Source code C.2: Full working example for the Wine Data Exchange format.