Research Document

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Executive Summary

For this semester, we took on the DRIVE MKB project and worked on it for about 17 weeks. DRIVE MKB stands for *"durable regional innovative flexible ecosystem."* This project aims to help restaurants and retail and wishes to enable them in self-sufficient digitalisation, in the hopes of granting them more survivability and flexibility during times of crisis. The research document is structured around the DOT framework and the methodology provided by the model to answer the research questions we came up with to answer DRIVE MKB's problem. Our main research question, which is the foundation of this document states, "To what extent can analysing an existing digital community provide insight on the best practices to create a self-sustainable community for the DRIVE MKB Project?" Our research is structured through triangulation, which ensures there are at least three different perspectives to answer each sub-research question.

The first phase of the project was being able to define what a digital community is and what the term self-sustainable mean in regard to these communities. To answer that question we utilized literature study, interview, and a GAP analysis. The plan is to use ICW (International Creative Women) as an example of a digital community that share similar characteristics to DRIVE MKB. Relating back to the question, the research provided information regarding the needs of a self-sustainable community. In regard to the DRIVE MKB project, adopting self-sustainable practices will improve their efficiency in terms of way of working and will reduce the impact of any world-wide crisis that occurs on them. Furthermore, one of the key points of self-sustainability is incorporating strong data collection techniques and creating a digital transformation that modernises their way of working.

The second phase of the project is related to digital transformation and how the use of data can help bring ICW additional value. To research this question, we used literature study, interview, and a data quality check. Additionally, this question had a detailed analysis of the different cloud storage solutions with the unique points as well as the benefits and limitations. The takeaways from this question are that ICW do collect data with multiple types, with information about customer, products, and more. Secondly, it provides insights on how the data can be used to add value for ICW.

The third phase for the project talks about the use of data from DRIVE MKB's perspective. To research this question we used literature study, interview, and a data quality check. These methods helped to reach the conclusion that the type of data collected is directly impacted by the type of community. These conclusions were reached through researching the performance of restaurants in 2020, which was during the peak of the void-19 pandemic.

The fourth and final phase of the projects talks about what requirements are needed by a digital community, specifically in regard to the DRIVE MKB project. The way we approached this question is through the use of literature study, exploring user requirements, and business case exploration. This chapter covers the importance digital transformation for digital communities and the benefits reaped as a result.

Furthermore, the influence of having rewards and incentives motivates the members to join the community. Finally, the size of the community is a key factor in determining the structure, as smaller communities are usually easier to maintain however, do not reap the same benefits as a large community would.

Subscription models are now a key component in most business models as they show a high degree of promise and help the organization receive a steady cash inflow. Furthermore, the different types of subscription models were researched, and the access model seemed the most relevant, as it mainly covers communities who provide exclusive content to their members. Finally, we decided to implement ISO 27001 as our IT governance model as it mainly focuses on improving security measures, which were not one of ICW's strong suits. Additionally, it helps with the management of the organization, and it also helps foster continuous improvement.

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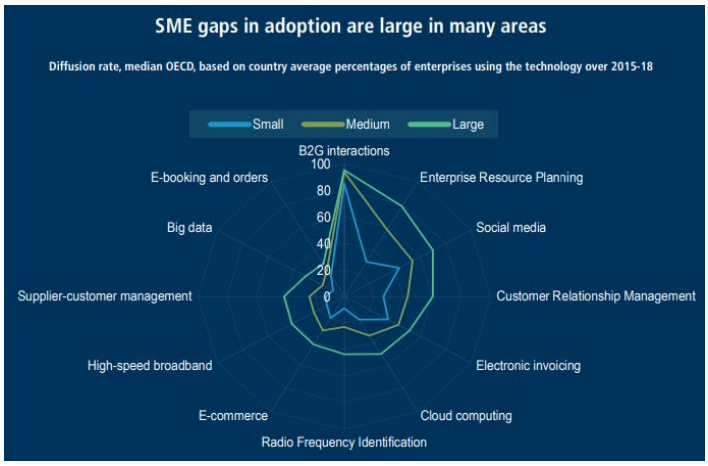
1 Introduction

The project was prompted by the Corona crisis. Retail and restaurants are sectors that have suffered especially under the crisis and the new (temporary) legislation endorsed by it. Although there had been a lot of creativity and entrepreneurship, to maintain turnover through home deliveries, limited openings and more, these sectors have shown they are less crisis resistant than their larger counterparts and have suffered severely. In 2020 one third of SMEs feared to be out of business without further support, before the end of the year (OECD, 2020).

A lot is done by manual labour in these branches, compared to larger companies few to no processes are automated or supported by technology presently. Debatably, digital transformation with a focus on data driven decisions is seen as the possibility for entrepreneurs to take ownership and grow in resilience to sudden changes as we have seen during the crisis. In combination with a digital community working together to compete with larger companies and franchises.

The project is called DRIVE MKB and is currently led by Carli Kleijnen who will be our project owner. It stands for *"durable regional innovative flexible ecosystem."* It aims to help restaurants and retail and wishes to enable them in self-sufficient digitalisation, in the hopes of granting them more survivability and flexibility during times of crisis. The project has been subsidiarised by the EU, and is done in cooperation with a set of partners such as Mindlabs, ROC Tilburg, Binnenstad Management Tilburg, Appsemble a.m.



1 OECD, 2021

2 Research Approach

The following chapter will describe the approach NextGen-Solutions is willing to take towards our core product, the research document. We intend to create an evidence-based, professional, and thorough approach towards reaching definitive, usable, and highly valued conclusions. We consider our research the basis for our other end-deliverables and see a direct causal correlation with the quality of the latter.

2.1 Methodology

Triangulation

Given the research nature of this project, a wide array of steps and procedures must be taken into account to ensure the validity and accuracy of all the conclusions that can be drawn from the research. The first factor is triangulation, which is a general idea that encompasses multiple methods that can be applied in different scenarios. In the context of our project, it will be used when gathering information on a single point from multiple sources and finding the common conclusion between them and implementing it in the research document. Using this technique ensures that the information used in this research is reliable and provides a glimpse of the different perspectives for the topic.

Sources verifiable

A research project requires the use of accredited and trust-worthy sources that will be used to gather information. Through the use of these sources, we can ensure that all the information gathered is of a high degree of reliability and can be used in this research. Google Scholar is a great location for finding credible sources that are reliable and can be used within this project. Given the fact that this is a research project and will use a multitude of sources, ensuring that all citations are clear and used correctly is crucial in any document submitted for the project.

Data verifiable

Any data that can be used in this project must be from a trusted source and must be credited with the location. Given that the use of financial figures is a possibility in this project, we will gather these numbers from multiple sources and average them in order to get the most accurate and reliable value that can be used throughout the project.

DOT (Development Oriented Triangulation) Framework

The DOT Framework is a method that is used to help create a structured research document that mainly outlines the what (domains), why (trade-offs), and how (strategies) of the research. The five main factors of this framework are the library, field, lab, showroom, and workshop.

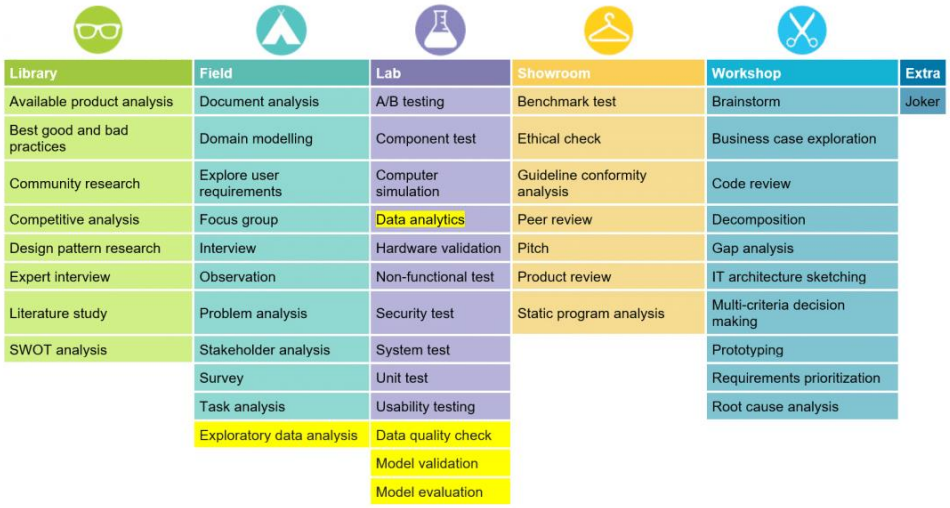
Library: This phase mainly explores any work that has already been done or theories that can be used to further the research. This is also known as desk research

Field: This phase is done in order to get to know the clients better as well as their requirements, limitations, and/or any other relatable information that can be used in the project.

Lab: This phase is mainly done to test any part of the project to ensure that everything is working as it should or if there are any needed changes.

Showroom: This phase is done in order to provide a platform to test any ideas related to the project to a panel of experts. This also provides a chance to present a prototype to the end-user and be able to describe everything related to the solution.

Workshop: This phase is used to explore any potential future scenarios and how they could work as well as the probability of success.



Library	Field	Lab	Showroom	Workshop	Extra
Available product analysis	Document analysis	A/B testing	Benchmark test	Brainstorm	Joker
Best good and bad practices	Domain modelling	Component test	Ethical check	Business case exploration	
Community research	Explore user requirements	Computer simulation	Guideline conformity analysis	Code review	
Competitive analysis	Focus group	Data analytics	Peer review	Decomposition	
Design pattern research	Interview	Hardware validation	Pitch	Gap analysis	
Expert interview	Observation	Non-functional test	Product review	IT architecture sketching	
Literature study	Problem analysis	Security test	Static program analysis	Multi-criteria decision making	
SWOT analysis	Stakeholder analysis	System test		Prototyping	
	Survey	Unit test		Requirements prioritization	
	Task analysis	Usability testing		Root cause analysis	
	Exploratory data analysis	Data quality check			
		Model validation			
		Model evaluation			

Figure 2; Research methods ("The DOT Framework", 2021)

2.2 Research questions

Main question

To what extent can analysing an existing digital community provide insight on the best practices to create a self-sustainable community for the DRIVE MKB Project?

Sub-questions

1. What defines a self-sustainable digital community and its needs in regard to the DRIVE MKB project?
2. What kind of data can be derived from the ICW digital community (if any), and what value does it have to that community?
3. What kind of data does a digital community produce in general, and how can this insight be used in the pursuit of a self-sustainable community in the DRIVE MKB project?

4. What would be the requirements of a digital community, in order to be self-sustainable and provide value to the DRIVE MKB project?

Question	Dependency	Methods
1	x	Literature study, interview, gap analysis
2	1	Literature study, Interview, data quality check
3	1	Literature study, Interview, data quality check
4	1, 3	Literature study, explore user requirements, business case exploration

2.3 Sub-Question I

The first question; '*What defines a self-sustainable digital community, and its needs in regard to the DRIVE MKB project?*' allows us to first define what a digital community is and the different types to gain insight on how they are started and how they work before our research. By understanding this we are able to comprehend how these communities operate and the characteristics required for a community to be considered self-sustainable. Defining these communities is necessary as seen in the dependency table in order to further elaborate on other questions and more importantly the main research question.

In order to answer this question, we will make use of the **literature study** method, requiring us to conduct desk research into the matter, and provide conclusions based on numerous verifiable sources. This will help us understand how a digital community is started and the steps and procedures needed to be taken to ensure that it is self-sustainable. After this, we will conduct necessary **interviews** to provide additional insight into the defining characteristics of a community, which will help identify the distinct types. Finally, we intend to create a **GAP analysis** which will help highlight the main differentiating features between a realistic solution to the desired solution. By creating this analysis, we will be able to bridge the gaps between the two solutions and incorporate some parts of the desired solution into our actual solution.

2.4 Sub-Question II

The second question; "What kind of data can be derived from the ICW digital community (if any), and what value does it have to that community?" allow us to understand how the use of data can help the ICW digital community and to what extent will they benefit from it. Furthermore, the data provided will be tested regarding quality and it will be researched on how this data can improve the ICW digital community. In order to provide insight in this we intend to do a **literature study** into benefits of data in digital communities and how we can apply the knowledge to ICW more specifically. Then we will do an **interview** with ICW to understand how the data should be structured to best suit the client's wants and needs. Finally, we will conduct a **data quality check** to ensure that all the data is accurate, relevant, complete, and up to date. Ensuring that the data quality is up to the required standard is crucial as it gives a confidence boost to the users.

2.5 Sub-Question III

The third question; 'What kind of data does a digital community produce in general, and how can this insight be used in the pursuit of a self-sustainable community in the DRIVE MKB project' allow us to understand how the use of data can help digital communities in general and to what extent will they benefit the DRIVE MKB project. The second and third questions are similar in nature, however the main differentiating factor between them is the target group which are the ICW community and DRIVE MKB, respectively.

To answer these questions, we will use the methods provided by the DOT Framework. **Literature study** will be used to research multiple sources to help clarify the need of data for digital communities in general and how they can apply to the DRIVE MKB project. Then again, the same as the second question, we will do an **interview** to understand how the data could help with the DRIVE MKB project. Finally, we will run a **data quality check** to confirm that all of the information is correct, relevant, complete, and updated.

2.6 Sub-Question IV

Question 4; "*What would be the requirements of a digital community, in order to add value to the DRIVE MKB project?"* will allow us to dive into the "why" of a digital community in respects to the DRIVE MKB project. Here we get a chance to define the characteristics that a community needs to have, in order to truly be useful. What values should it have, and what should be the return for customers? What makes the community sustainable and what value does it bring to the DRIVE MKB project?

We intend to first evaluate the question using **literature study**. We intend to gain insight into the possibilities of a community in regard to the DRIVE MKB project and what would be the best implementation. The requirements other communities have fulfilled in the past could certainly fuel this strategic advice. The **exploration of user requirements** could help us create an idea of what the DRIVE MKB project wants to achieve, and how it could do this through the implementation and setup of a digital community. What does the project require of this community to establish that value in a renewable, sustainable way that would actually add business value to the project as a whole, or even act as a medium through which the DRIVE MKB project connects to the SME's. Finally, we would like to conduct a **gap analysis** which should provide insight in the current state of the DRIVE MKB project and where it needs to be in order to add value for itself as a whole through the use of a digital community.

3 Alternative measures

During our research we encountered two obstacles which, if further research is done, might benefit our successor. The first would be the contact with other digital communities in order to interview them, observe them, gain insight in their data, or learn from them in any other way. Even though we reached out to upwards of 30 other companies none of them were willing to communicate or provide insight in their data. As an alternative measure, if possible, actually discussing the current research and its conclusions with existing communities could be of great benefit to the research. As such, these practical examples might also work as proof to solidify our advice.

The second obstacle we encountered is the absence of data for research. As we progressed through the project and our research, we made several attempts to gain data from different sources in order to further our research. Unfortunately, every source seemed lacking. The DRIVE MKB project itself had no existing data yet. As discussed earlier, the multitude of communities we reached out to safeguard their data from student research due to the value of it. And finally, The International Creative Woman were indeed very interested in generating, selling, and using data, however, they produce near to none. As an alternative measure one could collect data through any means, and already improve on the current research. We found no alternatives in the short time span of the project.

Finally, we intended for four research questions. However due to the nature of our project we added a few subsections during the course of the research. ICW specifically asked for certain deliverables as a return of investment for their time. Due to those deliverables containing research relevant to the DRIVE MKB project we decided to add them in consensus with our product owner, Carli Kleijnen. Added to this we received education and tutorship on different matters throughout the semester spawning the project. Some of these topics remain relevant to the outcome of our deliverables, and we intended to provide our insights. These topics include but are not limited to; subscription models, enterprise architecture and IT-governance & alignment.

4 Sub-Question I

Digital Communities

The concept of a digital community provides an online platform for groups of people to interact together and create a sense of inclusivity for the members. The two main types of digital communities are public social networks and support communities. In regard to the DRIVE MKB project, we will mostly be focusing on the support communities as they are the same as our main source (International Creative Women). Creating a digital community is a complex process which incurs multiple steps that must be considered in order to achieve a strong community that ensures people feel welcome and can voice their opinions. The main steps to creating a digital community are as follows: Identify key stakeholders, defining the purpose and goal, choosing the appropriate platform, develop rules, and promote the community (big commerce, 2022).

Support Community

These communities provide people a platform to ask for assistance from fellow consumers or any present experts regarding purchasing decisions or most general information (DiRose 2021). Such a community is similar to ICW as it strives to provide their members assistance on anything they might need regarding their starting up their businesses or any inquiries about running the business. Most support communities also include a search engine which provides the opportunity for members to search for previous questions other people had which could be applied to their issue. This community drastically cuts down on the time needed for people to look at multiple sources for a viable solution as it can provide options tailored for each user. Some examples of a support community are:

Reddit

This is one of the biggest online communities, which contains multiple sub discussions about almost every topic and every member has the capability to create new topics for people to discuss and voice their opinions. The platform over the years has gained over millions of users and by 2021 they have almost 48 million active monthly users (Statista, 2022). The success of Reddit helps provide evidence to the impact a digital community can have in terms of helping its members by providing relevant and useful information and keeping all of the users engaged.

Discourse Meta

This is an example of a support community as it provides a space where the members can converse about general topics, ask for support, and hiring developers (discourse, 2022). This is another example of a digital community which is less known than Reddit however accomplishes the same outcomes with a smaller audience, which could be considered a benefit as small communities tend to be easier to maintain and do not need a large group of moderators to observe the community at all times (Hwang, 2021)

Self-sustainable Community

The goal of this project is to be able to create a self-sustainable digital community that is able to support SMEs and provide added value to the DRIVE MKB project. The term self-sustainable refers to being able maintain oneself by independent effort (Merriam webster, 2022). In terms of a community being self-sustainable means that the community should always remain engaged, and the appropriate subscription plan must be considered to ensure that the running costs can always be covered. By keeping these factors in mind, the community will be maintained with minimum human intervention and as a result will be considered self-sustainable.

Keeping an online community engaged at all times can prove to be a challenge, however there are some steps which can be taken in order to ensure that there is constant interaction within the community. The key part for any community is the welcoming of new members to make sure that they feel welcomed and that they can voice their opinions at any given time. Secondly, having live interactions through video calls is a key component in creating an environment that encourages the sharing of ideas and makes the members feel that they are interacting with other humans. (Impact plus, 2018). Finally, given the subscription plan that was proposed by ICW having the members wither invest more time or more money to be a part of the community, which would essentially have one group become more engaged in the community than the other. By ensuring that the community is constantly engaged, and the implemented subscription plan is sufficient to cover all the running costs then the community can begin to be considered as “self-sustainable”.

The characteristic of becoming self-sustainable can also be viewed as a spectrum in the sense of how sustainable the digital community is. As a result, one must look at possible factors to increase the sustainability of the digital community which include diversity, openness, dynamism, and flexibility (Skarzauskiene, 2021). Each of these factors provides a unique aspect to the digital community and provides a more welcoming feel, thus helping them achieve a high degree of self-sufficiency. Having a self-sustainable community helps provide a stable platform for knowledge sharing and technology exchange. In terms of the DRIVE MKB project, having a self-sustainable community will help the restaurants and retail stores with their survivability as all the factors described previously help keeping the community engaged and informed. In terms of flexibility, having a self-sustainable community ensures that this characteristic is achieved through ensuring that these restaurants and retail stores are implementing the communities in order to help during times of crisis.

Businesses in the modern world are constantly striving to adopt self-sustainable business models in order to ensure the longevity and increase the chance of success in the market. Self-sustainable models can take many forms depending on the nature of the business such as being a physical store or an online business. In our case we are dealing with a digital community, so the relevant model has to geared towards digitalization and online content.

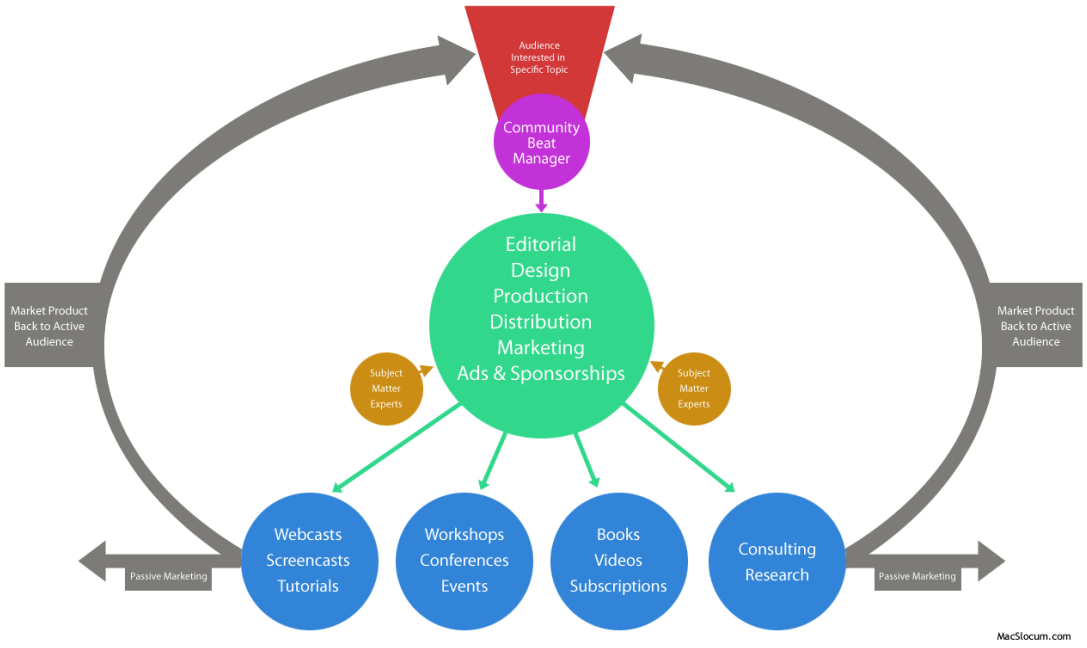


Figure 3; sustainable model for Online Businesses (Slocum, 2009)

The diagram shown above describes a model for sustainable online businesses and can apply to digital communities as well. It considers all the steps taken to ensure that the business is sustainable and is satisfying all the customers wants and needs in an efficient manner. The diagram is split into multiple components of equal importance in reaching the end-goal of self-sustainability, that can be linked with a digital community, are as follows:

- Audience interested in specific topics
    - This point is included to ensure that the online hosting location of the community is appropriate in regard to the overall message being conveyed by the community. It also needs to be engaging for all the members and encourages free and open communication on topics related to the appropriate subject matter. Finally, this point attempts to solidify the idea that the community needs to offer valuable content in order motivate the members.
- Community beat manager
    - The second part of the diagram references the moderator for the community and requirements needed to adequately fulfil this job. These requirements include having strong communication skills and informative on most subjects to offer their expertise when needed. How successful a community can be is heavily dependent on this role, and as such should involve extensive consideration as the ideal person to fulfil this role.
- Editorial, design, production, distribution, marketing, ads & sponsorship
    - This phase involves the people who decide what additional benefits the members get depending on their selected subscription plan. They base

these benefits on what the members need through strong communication and then focus on marketing these features to the target audience.

- Subject matter experts
    - These are the people who provide expert knowledge to the members and also provide workshops or information seminars. They also work with the previous group to understand what the members want in order to develop the exclusive content provided to them depending on the subscription.
- For pay products
    - These are the products or content that is provided to the members at an additional cost either directly or in the form of a subscription. These items need to be well defined so that the customers know what they are paying for. For ICW they need to begin convincing their members to participate in their subscriptions by offering them valuable services and information that is worth their money. This will help with their cashflow as it will bring in a stable income for the community which can be used in future expansions or events as well as covering some of the running costs.
- Market product back to active audience
    - Ensuring that everything is advertised in the correct manner and using an appropriate medium is essential to helping the community be successful and self-sufficient.

The diagram shown above is very detailed and conveys multiple points that define the key components of sustainability. Ensuring all of these points in the diagram are achieved will play a key role in ensuring that the community will be self-sufficient and play a significant role in the community's success (Slocum 2009).

Interview

An interview was conducted with Yolima from ICW in order to get some general information about communities and how they are running theirs. This also helped provide some strong insights on specific characteristics that help achieve self-sustainability as well as understanding most of their current processes.

1. What unique characteristics do you feel your online community offers that make you desirable?
    a. Very personal and intimate because the community is small (hundreds). Colleagues/family/friends. Everyone is connected on a personal and business level. The goal as a community is to help entrepreneur women and help them reach their business and personal goals.

2. How do you deal with new members as they enter the community?
    a. They receive messages through social media and their websites. Coffee and idea session as an introduction is done for both parties to meet each other. The same questions are asked for everyone and are done to help the

applicant introduce themselves. After that the recruiter from ICW can decide if it's a match and in that case, they are invited into the discord and can see all the events.

   i. Based on your answer to the previous question, do you feel that the general consensus regarding the introduction is well received by the members?
   ii. People enjoy this method as they meet each other physically, which helps with moving forward and getting to know each other better
      1. Based on your answer to the previous question, are there any improvements you feel can be made in order to make the members feel more welcomed and encouraged to voice their opinions in the beginning?
      2. Some people want answers quickly regarding the status of their application in order to be included in the community

3. Are your inflows from the online community sufficient to cover the running costs?
   a. Sometimes yes sometimes no, it is generally very inconsistent. Subscription plan could be very useful.

4. An online source mentioned the key factors for an online community to become self-sustainable, do you believe the following characteristics apply to your digital community:
   a. Diverse: Yes
   b. Openness: Yes, however business topics only, no politics or other controversial topics.
   c. Dynamism: Yes
   d. Flexibility: Yes

5. Do you have content experts to help provide the members with reliable answers about any questions they may have?
   a. They do sessions on specific topics (example tax moments get a session to explain everything related to it), workshops and sessions. Both people and content experts can answer each other. Furthermore, there are no labels for content experts.
      i. If your answer to the previous question was yes, what are the required classifications to become considered a content expert?
      ii. Based on their interview and knowledge about the person they can refer to some people as content experts but no specific qualifications

6. How do you expect your community to remain relevant?

a. We had meetings with Eindhoven365 in order to attract internationals into the city. Next plan is retaining these internationals and keep the city more welcoming of these people and work harder on the spouses, so it is very beneficial for their community to be in such a city (perfect market). The city is becoming more interested in such businesses and trying to motivate them by providing connections and opportunities.

7. Do you feel that the current hosting location for your community is sustainable in the long-run?
    a. It is sustainable, it provides many possibilities that are yet to be explored and contains many options which work well with many people, however there are some others that do not appreciate it. We have 100 discord members and 90 WhatsApp members.

8. An online source states that smaller communities are easier to maintain than larger ones. In your opinion, will the quality of the community remain unchanged as the number of members increase? Or will the large numbers require restructuring how the community works?
    a. The larger the community becomes the harder it will become to maintain and to have contact and to organize projects and currently there is not enough capacity to answer all these calls on time. We will have to change the way we operate in specific operations, which shows our dynamism and flexibility. Now there is a clear roadmap and getting them acquainted with events. If we remain small, we will be able to adapt and react and move forward easier. Limited resources have a direct impact on this factor.

9. What are some characteristics that you feel are missing (or not stressed on) within your community that is holding it back from reaching a higher potential?
    a. In terms of potential, we would like to (in the niche we are working in, which is SMEs) eliminate a certain underestimation for their community. Being able to clearly communicate the value of being an entrepreneur will be very beneficial to ourselves and the people.

GAP Analysis

1. Identify the current situation.

Define what is important for you in your department or organization.

Currently most SMEs that are included in the digital communities are not keeping detailed records of their processes and do not have sufficient data to be used in analyses or keeping track of sales. This point mainly revolves around the topic of digital transformation and is becoming an essential part for most modern business as of the year 2020 due to covid-19 crisis. The digital community that has been implemented by International Creative Women (ICW) is currently free for users, which is not a sustainable model in the long-run and does not provide a sufficient indication of how helpful a community can be.

2. Set S.M.A.R.T. goals of where you want to end up.

Your goals should be specific, measurable, achievable, relevant and time-bound. List a few goals that meet these criteria.

In our project the essential characteristic of a digital community is to become self-sustainable which can be achieved be keeping most members engaged at all times, which will help create a welcoming environment. Secondly, ensuring that there are content experts as members in the community is an essential component, as they provide assistance for the more complicated problems that cannot be addressed by normal members. A community also requires an extensive subscription model to be able to classify the members into different groups depending on the added value they hope to provide (either money or time), which has to be outlined in order to become self-sustainable. Finally, the transition to implementing data driven solutions by keeping detailed records is the final step to ensure that the community can help make the SMEs more efficient and sustainable in the long-run.

3. Analyse gaps between where you are & where you want to be.

Get to the details of why you aren't as successful as desired. Is there an issue with processes, personnel or something else? List culprits here.

Currently ICW's community is free to access for all their members as they did not have a subscription plan to outline what users needed to provide in order to become members (either time or money). It then became an issue regarding fear of change from their side as they were unsure how their users would react to a new subscription plan that would require them to invest money to participate in the community or become more engaged in the daily discussions held within the community. They also want the community to be self-sustainable which is difficult for them due to the lack of knowledge regarding the criteria that must be met in order to satisfy this characteristic.

4. Establish a plan to close existing gaps.

Now that you've identified the issues it's time to solve them. Develop action items that bridge the gaps between you and your end goals.

- Analyse the costs for running a digital community to decide on subscription costs
- Find content experts and take into account their costs when creating the subscription model
- Implement data solutions to become more modern in their way of working and keep better records to be used in terms of crisis.

Conclusion

The question for this section was referring about what a self-sustainable community is and how it is related with the DRIVE MKB project. To answer this question, we utilized multiple research methods from the DOT framework, which provided valuable information relevant to the question. The methods used in this question were literature study, interview, and a GAP analysis. Each method provided its own unique information and the combination of all three provided sufficient information to approach the question.

Going back, the definition of self-sustainability and how it relates to community was, an entity that is able to maintain itself without outside intervention. Throughout this section how a community is considered self-sustainable was clearly defined and all of the characteristics required in order to reach that status. Furthermore, it was researched that being self-sustainable is not a simple characteristic, on the other hand, it is a wide spectrum. Fulfilling each individual characteristic of sustainability ensures the longevity of a community and improves the way they operate. This is due to the fact that being sustainable does not only impact finances, however it also influences the way the community is run and how the members interact with each other.

By using ICW as an example for how a community operates and the needs for it to be considered self-sustainable, we are able to relate back to the core of this project which is the DRIVE MKB aspect. Ensuring these characteristics are in the restaurants and retail stores decreases the chance of failure and reduces the impact of any crisis that may occur (Ex. Covid-19). This is due to the fact that the characteristics defined by self-sustainability prepare businesses for most worst-case scenarios and offers them a better chance of survivability. In conclusion, the research for this question proved the importance of self-sustainability and that it is essential for most businesses including DRIVE MKB.

5 Sub-Question II

What kind of data can be derived from the ICW digital community (if any), and what value does it have to that community?

5.1 Literature study

Due to a goal for self-improvement, humans are always attempting to access existing knowledge and produce new ones from the data available. The procedures are carried out by processing and changing data into information, which is widely acknowledged. In terms of life regulation, collecting info from data is critical. Firms, in particular, must rapidly and accurately store and turn data into information in order to fulfil goals such as gaining a competitive advantage, manufacturing new goods, moving the company forward, and stabilizing internal operational services. [2015, Hakan Ozkose]

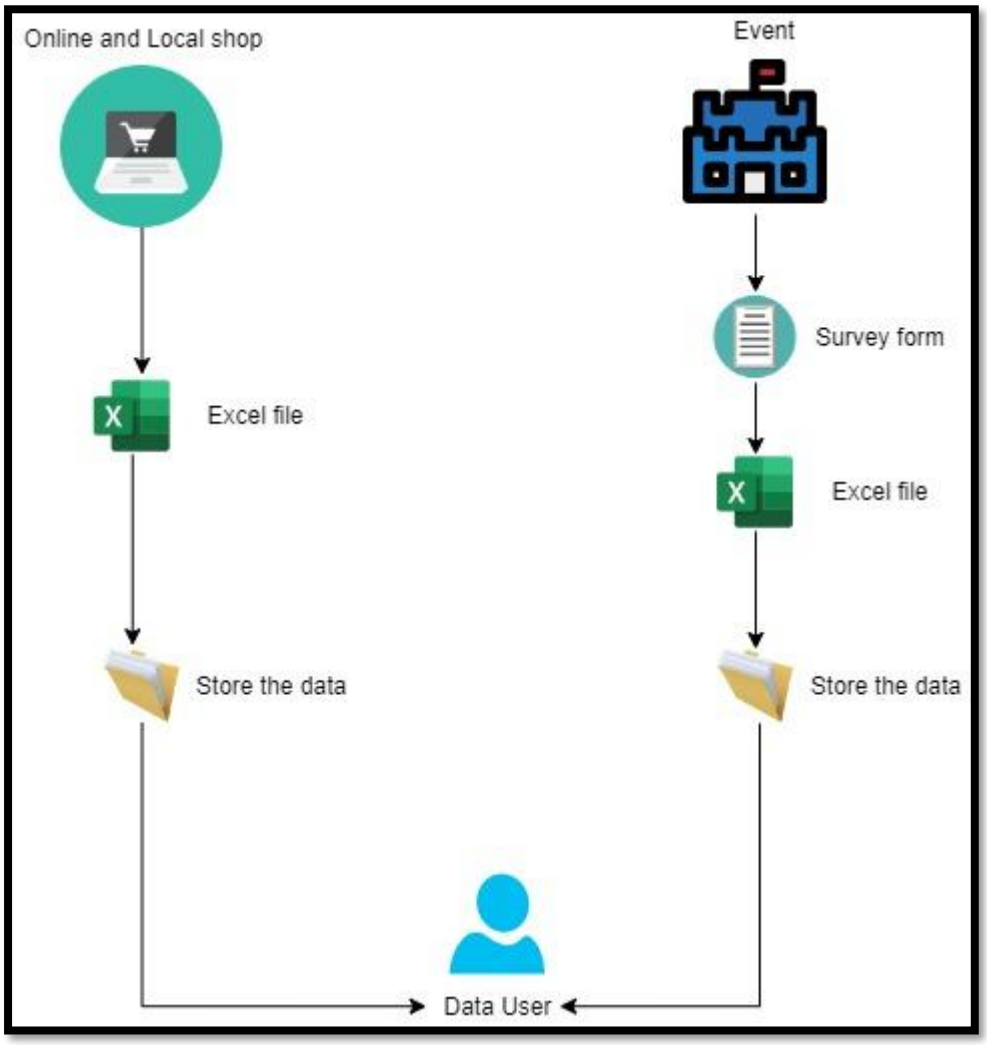


Figure 4: Current Data Process ICW

Currently, ICW data is coming from two main places. First, ICW has an online and physical shop that they are using for customer and product data. Moreover, they often

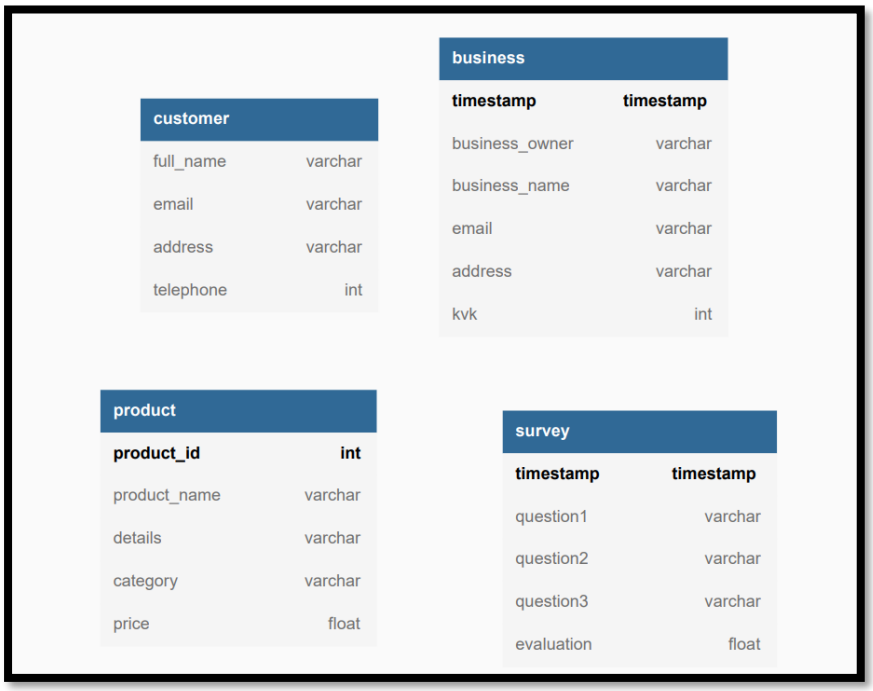
times organize events. Additionally, they are creating surveys which are sent to the members in order to receive feedback, which can be processed to improve these events. The main problem here is that the collected data is kept in different places and in the end, it takes time for the data user to analyse it.

ICW is working with different type of data. They are interested in customer (name, address, email, telephone), business, product, and orders information. From our interview with them, it is clear that the community is gathering most of their data from the online shop. Therefore, we can create their current data model with information that they are collecting. They do not have database; as a result, the data tables are not connected, and this can cause problems in the future.

The main goal of ICW is to gain insights from data in the current process in order to estimate the number of times customers are buying from their online catalogue. Additionally, they aim to process the data to target the people that are happy from the organized events. They believe that in the future the data can help them answering three important questions:

- How do the users interact with the community?
- What type of event do the customers need?
- How profitable is the new created business?

Unfortunately, ICW does not have database and they are collecting the data only in excel files. Therefore, we created how their current data model looks like. The main idea here is to make the process as normalized as possible. For example, the customer and product table are not connected, and the business table is just giving information about the members' businesses. However, this process needs to be improved in order to ICW be sustainable in the future.


customer
full_name varchar
email varchar
address varchar
telephone int
business
timestamp timestamp
business_owner varchar
business_name varchar
email varchar
address varchar
kvk int
product
product_id int
product_name varchar
details varchar
category varchar
price float
survey
timestamp timestamp
question1 varchar
question2 varchar
question3 varchar
evaluation float

5.2 Interview

1. What type of data are you using in your online community?

- ICW is using different type of data. For example, the customer and business information details such as names, emails, and strings are used. However, in regard to financial data, the orders information is using float and integer types of data.

2. How are you collecting your data?

- We are collecting our data online from surveys and the software that we are using for the online orders.

3. Do you think your current data is bringing some value to the community?

- We think that our current data is bringing us some value but not enough. For example, we are interested in the customers which are attending our events and buying the online products. However, for the future we are planning to search for different methods about data improvements.

4. What kind of insights do you gain from your data that is beneficial for the community?

- The most important insight we are monitoring is tracking how many times a customer is buying our products.

5. Do you use data security methods for the customer information?

- **If so, could you give examples?**

- The community is using website declarations for the customer data. Furthermore, after we are finished with the analysis, the data that is no longer needed is deleted from the location.

6. Do you use surveys to boost your customer satisfaction?

- Yes, we are using surveys and forms to understand the customer needs. They are done most often after an event or workshop organized by the community itself.

7. Do you believe the data can improve your community in the future?

- We strongly believe that data can improve our services. For example, we are planning to be able to gain insights from three important questions in the future, which are:

1. How do the users interact with the community?
2. What type of event do the customers need?
3. How profitable is the new created business?

5.3 Data quality analysis

Goal of data analysis

First, we are going to check ICW's data quality and suggest some improvements. After this we are going to conduct exploratory data analysis to summarize some insights and, in the end, we will visualize the results from their survey.

Contents

This analysis implements all specific tasks in applying EDA techniques:

- Importing the data
- Data Definition
- Retrieve Data information Data quality analysis
- Data manipulation and visualization

Loading libraries

```
import numpy as np
import pandas as pd
import sklearn as sk
import matplotlib
import matplotlib.pyplot as plt from
IPython.display import displayimport
seaborn as sns

print('numpy version:', np.__version__) print('pandas
version:', pd._version_) print('scikit-learn
version:', sk._version_) print('matplotlib
version:', matplotlib.__version__)
```

Importing the data

- In this step, we are going to load the data into the data frame.

```
market = pd.read_excel (r'Spring Market (Responses).xlsx')
market.head()
```

	Timestamp	Name	Email	Name of your business	Address of your business	Description of your business	Unname
0	2022-03-17 12:37:31.162	Amanda Burkovski	amandaelisrb@gmail.com	Violet Art Shop	Willem van Hornestraat 28	Original watercolour and oil paintings	Na
1	2022-03-17 13:25:33.393	Marcela Rojas	elmetatemx2020@gmail.com	El Metate	Pastoor van Leeuwenstraat 46	Mexican food Meat & Veggie	Na
2	2022-03-17 21:05:38.122	Mariana	marianaspijkers@gmail.com	Artesanias dulces	Dunhei 6	I'm selling Colombian craft made locally. It h...	Na

Data Definition

In this chapter, we are going to describe each attribute or domains from our data file.

- **Timestamp**: The date that the response was made
- **Name**: The name of the business owner
- **Email**: The email of the business owner
- **Name of your business**: The name of the business
- **Address of your business**: The address of the business
- **Description of your business**: Details about the business
- **Website or social medial profile**: Business Website
- **Stand**: Information about the Stand
- **WhatsApp number**: Phone Number

Retrieve Data information

In this chapter, we are going to see the summarized information about the data frame.

```
market.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 25 entries, 0 to 24
Data columns (total 11 columns):
 #   Column                                                Non-Null Count  Dtype
---  ------                                                --------------  -----
 0   Timestamp                                             25 non-null     datetim
e64[ns]
 1   Name                                                  25 non-null     object
 2   Email                                                 25 non-null     object
 3   Name of your business                                 25 non-null     object
 4   Address of your business                              25 non-null     object
 5   Description of your business                          25 non-null     object
 6   Unnamed: 6                                            0 non-null      float64
 7   Website or social medial profile. Add the full url address  25 non-null  object
 8   Whatsapp number                                       25 non-null     object
 9   Stand                                                 25 non-null     object
 10  Unnamed: 10                                           2 non-null      object
dtypes: datetime64[ns](1), float64(1), object(9)
memory usage: 2.3+ KB
```

We can see that there are two columns that are not important for the data because they do not have values – column 6 and 10.

Data quality analysis

A data quality assessment's goal is to find inaccurate data, estimate the effect on business operations, and take corrective action. In our analysis, we are going to use 5 categories: *Validity, Accuracy, Completeness, Consistency and Timeliness*.

Validity

- Here, the most important thing is that every measure or column must have the right data type - string, Boolean, float and more.

In our case, we did not find any problems with this data quality category. Most of the columns are information about the business and they are intended to have the string data type which in python is called object.

Accuracy

- The most important factor is whether the data has accuracy in the file. For example, a customer must have the correct address and telephone number according to the entered information about him/her.

In our data sample, the address of the business is correct. However, there can be some improvements regarding the method of saving the entered data. For example, this data file will be much more efficient for data analysis in the future, if there is one separated column for the address - postcode. The name of the street, number and postcode are much easier to work with, if they are in separate columns.

Completeness

- In this step, it is important to check the data for missing values. If they are not important, for visualization and analysis purposes it is simple to remove these values.

In our example, we have two columns with missing values - Unnamed 6 and Unnamed 10. They did not bring any value for the business information; therefore, they can be removed.

```
market.drop('Unnamed: 6', inplace=True, axis=1)
market.drop('Unnamed: 10', inplace=True, axis=1)
market.isnull().sum()
```

```
Timestamp                                                0
Name                                                     0
Email                                                    0
Name of your business                                    0
Address of your business                                 0
Description of your business                             0
Website or social medial profile. Add the full url address    0
Whatsapp number                                          0
Stand                                                    0
dtype: int64
```

Consistency

- The degree to which a collection of measurements is comparable across systems. When two data items in a data set contradict each other, inconsistency exists.

We found that in the WhatsApp number column, some of the people added their national number code to their telephone number. This is great to have, however some people are not doing this operation. Therefore, our suggestion is to add a mandatory field of their national code number when they are entering the information and with this, the consistency between the telephone numbers will be solved.

```
consistency = market[['Whatsapp number']]
consistency.head(10)
```

	Whatsapp number
0	+31622247163
1	+393801590417
2	0621335584
3	+31616005216
4	0638349216
5	+310619838155
6	+49 177 4547863
7	06-48382808
8	0650610368
9	0628167916

Timeliness

- This step is looking for time related columns for your data. This is helping most of the time for data-driven decisions because time is a very important factor for data analysis and to draw conclusions from it.

In our case, we have a date column which is called Timestamp. It is helpful because you can separate your insights into days, months and/or years according to your goals.

Data manipulation and visualization

In this chapter, we are going to show the visualization of our results. Furthermore, we will use a different data sheet to achieve this, because we want to show more valuable information for the client. It will utilize data from one of ICW's surveys that they are doing for their workshops.

```
survey = pd.read_excel (r'visual branding workshop.xlsx')
survey.head()
```

	Submission Date	Form Title	Name	Email	Do you authorize us to send you information, news and promotions ?
0	2020-10-13 10:53:18 UTC	Contact us	Bassant Samir	bassant.samir@gmail.com	yes
1	2020-10-13 12:49:42 UTC	Contact us, Contact us	Donna Robins	donna.robins81@gmail.com	yes

```
survey.rename(columns = {'Do you authorize us to send you information, news and promoti
survey.info()
```

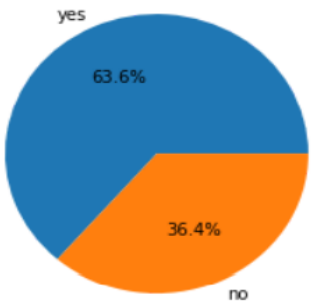
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 22 entries, 0 to 21
Data columns (total 5 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   Submission Date  22 non-null     object
 1   Form Title       22 non-null     object
 2   Name             22 non-null     object
 3   Email            22 non-null     object
 4   promotion        22 non-null     object
dtypes: object(5)
memory usage: 1008.0+ bytes
```

```
survey['promotion'].value_counts()
```

```
yes    14
no      8
Name: promotion, dtype: int64
```

```
y = np.array([14, 8])
labels = ["yes", "no"]

plt.pie(y, autopct='%1.1f%%',labels = labels)
plt.show()
```



From this pie chart, we can see that there are around 60% of people that want to receive promotions on their email. Therefore, these are positive results for ICW because they can use this to create an email marketing strategy for their customers.

Data Storage and Configuration

As stated previously data is now an essential resource and as such needs to be protected and stored in a secure location that is only accessible by the community owners. This brings us to the topic of cloud storage services which allows businesses to store their files in secure off-site locations. This provides multiple advantages in terms of saving costs incurred through maintaining physical servers on-site which involve high starting and running costs. It also allows for easy accessibility in terms of working remotely as the files can be accessed from any location with an internet connection. Finally, uploading encrypted files to the cloud server ensures that others will not be able to intercept or access the potentially sensitive nature of the information or data. ("Why Your Organization Should Store Data in the Cloud" n.d.)

Given the rise in popularity due to the high demand for cloud storage solution, many companies have dived into this market creating multiple options to choose from, each

with their respective advantages and disadvantages. The top two storage solutions we will look at are Google Cloud Platform and Oracle Database.

Google Cloud is one of the newer cloud-based platforms that offers similar services as its predecessors, AWS (Amazon Web Services) and Azure. However, given that it is newer than the other options there is still limited functionality and is still not utilized as a main cloud storage solution for businesses. On the other hand, GCP (Google Cloud Platform) offers expertise in the fields of big data, analytics, and machine learning (Dent, n.d.). Moreover, GCP is a platform that can be used by businesses of any size due to their extensive documentation which helps with the setup process, which is applicable in ICW's case (Yehuda 2020). GCP is also known for having a convenient UI which makes it easy to use for their consumers that do not necessarily have to be tech savvy (Perveez 2022). Finally, using this cloud base solution provides access to other Google services due to their built-in integration, which allows users access to services such as Kubernetes and more (Vidal 2018).

Oracle Autonomous Database is a cloud-based platform with high-level database technologies that offer high performance and has a high degree of reliability (Yehuda 2020). Oracle has many unique selling points, however the one which attracts their customers attention is their multiple database support. This means that within a transaction, Oracle is able to access all of the databases included and manage them. On the other hand, Oracle is one of the more complex cloud storage solutions and is not easily grasped by people who are not tech-savvy or have previous knowledge regarding databases. Furthermore, their pricing is expensive compared to some of their competition, which drives businesses to cheaper alternatives (Singh 2022).

Conclusion

All things considered, we found that ICW is working with different types of data in their community. For example, they are gathering information about customers (name, email, address), new created businesses and online orders. Therefore, we can say that they collect a variety of data types – informational, financial, and categorical. This could be very helpful for the community itself because they can make different insights based on their goal. For example, they are interested in a number of customers that are buying specific products and the clients that are attending the event with positive feedback. So, they can target these customers and improve their products and events.

The data storage solution is an essential factor for ICW and as such required extensive research regarding key points such as price point and usability. These are some of the points that were discussed in the section above in an attempt to provide sufficient information on the best option for cloud storage that should be implemented by ICW. Furthermore, having a good data storage solution is essential as it will store all of ICW's data in the hopes of providing additional insights for the community. The proposed data storage solution will be discussed further in the advisory document referencing the research found above.

6 Sub-Question III

What kind of data does a digital community produce in general, and how can this insight be used in the pursuit of a self-sustainable community in the DRIVE MKB project?

6.1 Literature study

We were required to work, learn, and buy online due to the COVID-19 pandemic. As a result, employees may become disconnected from the organization's aims and objectives. Using data in communities might be the ideal option to improve data management processes and connect a diverse workforce by maximizing communication. Production and services, as well as communication and societal activities, are all altered because of digitalization. It makes things easier, faster, cheaper, easier, or better in many cases, but it can also make things more complicated or problematic in others: companies must reinvent their business models, markets are shaken up by new types of players, and globally active digital platforms that occupy a position of power can inhibit companies' ability to compete.

The majority of communities have made technological investments in data collection, storage, processing, and analysis. They were able to experiment with data and analytics as a result of this. It takes the ability to integrate data into operational processes, as well as users' confidence and usage of data for insights and decision support, to deploy data in your business. This change will need strong collaboration and the development of new data skills. Users can interpret, assess, and use data, as well as extract value from it, with these abilities. [YOOI,2021]

Advantages of data-driven community management:

- *Using data increases the efficiency in the community.*

The utilization of digital technology tools boosts your company's efficiency. Due to the use of digital transformation, which allows better levels of cooperation and faster information exchange, businesses will be able to respond to market demands far more quickly than previously possible. Businesses with advanced ICT have access to information and resources from outside their boundaries, resulting in increased creativity and outcomes. [2016, IEEE]

- *Using data improves pricing.*

It is considering the wealth of data now accessible, which allows corporations to make far better pricing decisions. For example, a 1% increase in pricing results in an 8.7% increase in operating profits. Despite this, it is estimated that up to 30% of the hundreds of pricing decisions made each year do not result in the best deal. [2018, Baker]

- *Data can help to grow your community.*

Age, size, location, legal form, and sector are all linked to business growth, according to research undertaken on the economies of the United States, Germany, Australia, and Scotland. Much of this study has concentrated on manufacturing companies, giving limited information on the impact of changes in industrial sectors on these characteristics. [Taylor & Francis,2019]

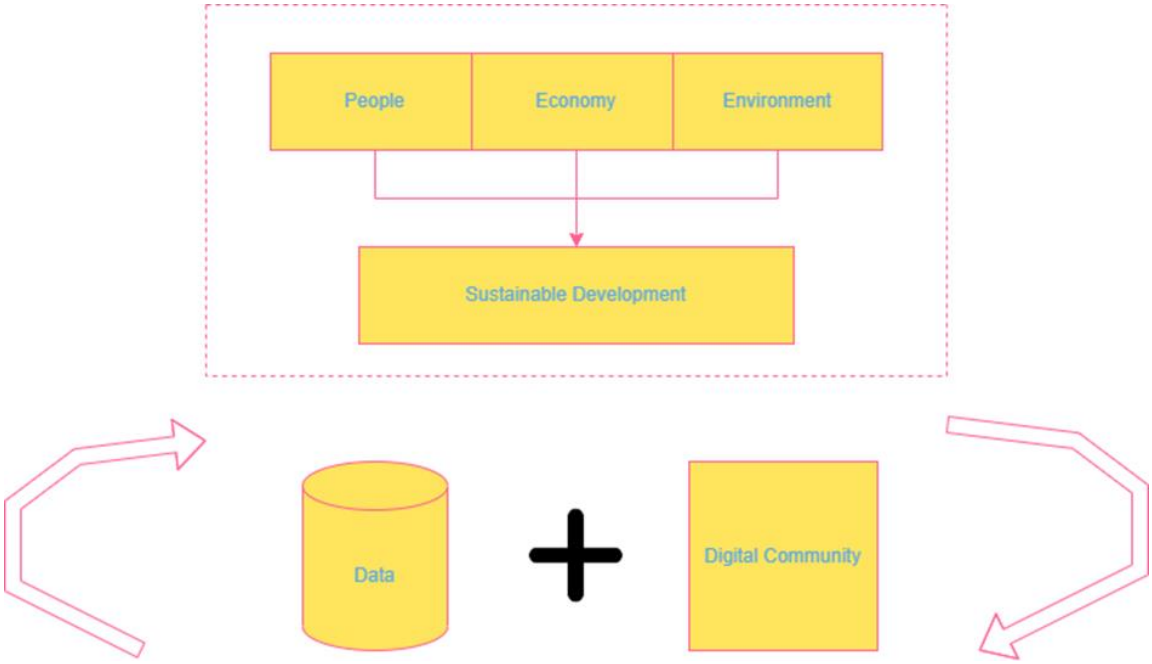


Figure 6: Sustainable Digital Community

Research about smart cities and sustainability explains very well what a sustainable development in a certain community is. Examples of the distinctions between a digital city and a smart city may be necessary for a better understanding. A digital city or community is one that is constructed on information and communication technology and, more specifically, the internet, with the goal of providing people with information and e-services, as well as creating a channel of communication between citizens and government. A smart city, on the other hand, is one that is more focused on long-term economic growth and a higher quality of life, while still maximizing the use of natural resources through public participation. The majority of the world's resources are consumed in cities, and urban life causes the most environmental damage. [Kudva,2019]

Social, economic, and environmental development are the three main categories of sustainable development. In general, sustainable development requires social and economic reform while minimizing the need for environmental protection.

Data collection in an urban environment is not a new process. The development of modern civilizations, and also their innovation, have always been tracked. Early versions of Data Collection contained records on local inhabitants kept by municipalities and churches. [Lazer,2014]. It was previously collected manually in analogue forms, but developments in computer technologies have revolutionized the process. Most of today's urban data is captured through a variety of sensors that run

invisibly and automatically across a city. All industries and domains of business and society are becoming more linked with digitalization. [Batty,2013]

The best Big Data project is Google's prediction of the spread of the pandemic virus (H1N1) in the U.S.A. To do so, Google combined data from users' average search phrases from 2003 to 2008 with information from the Centre for Disease Control and Prevention. The study's findings projected that the virus will spread in the next years. [Mayer-Schönberger,2019] While the study has been criticized in recent years for its errors, there is no question that Big Data analysis may be beneficial. For example, the LED lights and landscaping in Los Angeles are both the product of Big Data research and help save water and electricity power. [Kitchin, R.,2014]

One more example of using data in communities is from the book - Data analysis in community and landscape ecology. This book is for researchers who utilize computers to analyse field data on plant and animal populations as well as their surroundings. In this research different data types were used. For example, the Al horizon's thickness was measured in cm, making it a quantifiable variable. The soil's moisture content was classified into five categories. As a result, it is an ordinal variable. Finally, the grasslands can be utilized for three different purposes: hayfields, grazing, or a mix of the two (intermediate). Both variables are nominal, however the grassland usage is occasionally treated as an ordinal variable.

6.2 Data quality analysis

Introduction

Data source: *https://www.kaggle.com/datasets/michau96/restaurant-business-rankings-2020? resource=download*

In this section, we will do an exploratory data analysis to summarize some insights of various restaurants based on locations and sales. After this we are going to use statistical graphics and other data visualization methods.

The data may be used to tell the story of what restaurants were like in 2020, as well as the differences between large and small enterprises.

Why did we choose this data set? - There are many sources nowadays where you can find your data sets. However, we chose this file, because it was very similar to our research and future goal for the DRIVE MKB project. Because there are many different restaurants which is similar to one digital community. Therefore, we think this is particularly good example of data analysis from this point of view.

Contents

This analysis implements all specific tasks in applying EDA techniques:

- Importing the data
- Data Definition
- Retrieve Data information
- Data quality analysis

- Data manipulation and visualization

Loading libraries

```
import numpy as np
import pandas as pd
import sklearn as sk
import matplotlib
import matplotlib.pyplot as plt from
IPython.display import displayimport
seaborn as sns

print('numpy version:', np._version__) print('pandas
version:', pd._version_) print('scikit-learn
version:', sk._version_) print('matplotlib
version:', matplotlib.__version__)
```

Importing the data

- In this step, we are going to load the data into the data frame.

```
future50 = pd.read_csv('Future50.csv')
future50.head()
```

	Rank	Restaurant	Location	Sales	YOY_Sales	Units	YOY_Units	Unit_Volume	Franchising
0	1	Evergreens	Seattle, Wash.	24	130.5%	26	116.7%	1150	No
1	2	Clean Juice	Charlotte, N.C.	44	121.9%	105	94.4%	560	Yes
2	3	Slanfish	Huntington Beach, Calif.	21	81.0%	21	90.9%	1370	Yes
3	4	Clean Eatz	Wilmington, N.C.	25	79.7%	46	58.6%	685	Yes
4	5	Pokeworks	Irvine, Calif.	49	77.1%	50	56.3%	1210	Yes

Data Definition

In this chapter, we are going to describe each attribute or domain from our data file.

- **Rank:** Position in ranking
- **Restaurant:** Name of restaurant
- **Location:** The location of restaurant
- **Sales:** Sales in millions
- **YOY_Sales:** Year on year sales increase in %
- **Units:** Number of premises
- **YOY_Units:** Year on year premises increase in %
- **Unit_Volume:** Average Unit Volume
- **Franchising:** Is the restaurant a franchise? (Y/N)

Retrieve Data information

In this chapter, we are going to see the summarized information about the data frame.

```
future50.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 50 entries, 0 to 49
Data columns (total 9 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   Rank          50 non-null     int64 
 1   Restaurant    50 non-null     object
 2   Location      50 non-null     object
 3   Sales         50 non-null     int64 
 4   YOY_Sales     50 non-null     object
 5   Units         50 non-null     int64 
 6   YOY_Units     50 non-null     object
 7   Unit_Volume   50 non-null     int64 
 8   Franchising   50 non-null     object
dtypes: int64(4), object(5)
memory usage: 3.6+ KB
```

Now, we can see the summary statistics of our data below.

```
future50.describe(include='all',).T
```

	count	unique	top	freq	mean	std	min	25%	50%	75%	max
Rank	50	NaN	NaN	NaN	25.5	14.5774	1	13.25	25.5	37.75	50
Restaurant	50	50	Joella's Hot Chicken	1	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Location	50	39	New York, N.Y.	8	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Sales	50	NaN	NaN	NaN	33.78	9.59653	20	24.25	34.5	42	49
YOY_Sales	50	49	19.5%	2	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Units	50	NaN	NaN	NaN	34.7	24.5276	7	16	27	45.5	105
YOY_Units	50	41	16.7%	4	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Unit_Volume	50	NaN	NaN	NaN	1592.6	994.677	465	867.5	1260	2020	4300
Franchising	50	2	Yes	29	NaN	NaN	NaN	NaN	NaN	NaN	NaN
YOY_Sales_numbers	50	NaN	NaN	NaN	33.698	24.5492	14.4	20.9	25.5	33.825	130.5
YOY_Units_numbers	50	NaN	NaN	NaN	27.446	23.2311	4	14.3	19.9	32.675	116.7

Data quality analysis

The purpose of a data quality evaluation is to identify incorrect data, evaluate the impact on company operations, and take action.

To be more specific, it depends on the company's size and type. As a result, it is clear that no one-size-fits-all set of criteria can be applied to every business. Validity, accuracy, completeness, consistency, and timeliness are the five characteristics we will utilize in our analysis.

Figure 7; Data Quality Dimensions

Source image: https://bluwaveanalytics.com/growth/data-quality/

Validity

The extent to which the measurements comply to established business norms or limits. Data-Type Constraints — For example, values in a column must be of a specific data type. Range Constraints: Numbers or dates should normally fall inside a specific range.

In our case, we fixed the data type problem with two columns of our data set: *YOY_Sales* and *YOY_Units*. From objects we made them float because they were in string format.

```
future50['YOY_Sales_numbers'] = [float(i[:-1]) for i in future50['YOY_Sales']]
future50['YOY_Units_numbers'] = [float(i[:-1]) for i in future50['YOY_Units']]
```

```
future50[['YOY_Sales_numbers','YOY_Units_numbers']].dtypes
```

- YOY_Sales_numbers: float64
- YOY_Units_numbers: float64

Accuracy

This is when you are comparing the accuracy of two or three related columns. For example, customer with location or zip code.

In our data, the *Location* column matches up with *Restaurant* correctly.

```
accuracy = future50[['Restaurant', 'Location']]
accuracy.head(10)
```

	Restaurant	Location
0	Evergreens	Seattle, Wash.
1	Clean Juice	Charlotte, N.C.
2	Slapfish	Huntington Beach, Calif.
3	Clean Eatz	Wilmington, N.C.
4	Pokeworks	Irvine, Calif.
5	Playa Bowls	Belmar, N.J.
6	The Simple Greek	Blue Bell, Pa.
7	Melt Shop	New York, N.Y.
8	Creamistry	Yorba Linda, Calif.
9	Joella's Hot Chicken	Louisville, Ky.

Completeness

To what extent have all essential metrics been identified? This is because it cannot deduce information that was not captured when the data was initially obtained, as data cleaning techniques cannot fix abnormalities. If a method demands that such columns not be empty, one can get around the problem by specifying a value that indicates "missing" or "missed," but this does not imply that the data has been finished.

In our case, we analysed that there are no columns with missing values - You can see them listed below.

```
future50.isnull().sum()
```

```
Rank                0
Restaurant          0
Location            0
Sales               0
YOY_Sales           0
Units               0
YOY_Units           0
Unit_Volume         0
Franchising         0
YOY_Sales_numbers   0
YOY_Units_numbers   0
dtype: int64
```

Consistency

The degree to which a set of measures may be compared across different systems. Inconsistency arises when the information between two columns contradicts.

In our data set, we did not find inconsistency between any of the columns.

Timeliness

The “timeliness” factor of data quality is whether your data is time related. Let us say you need financial data every quarter; the data is timely if it arrives when it is expected to.

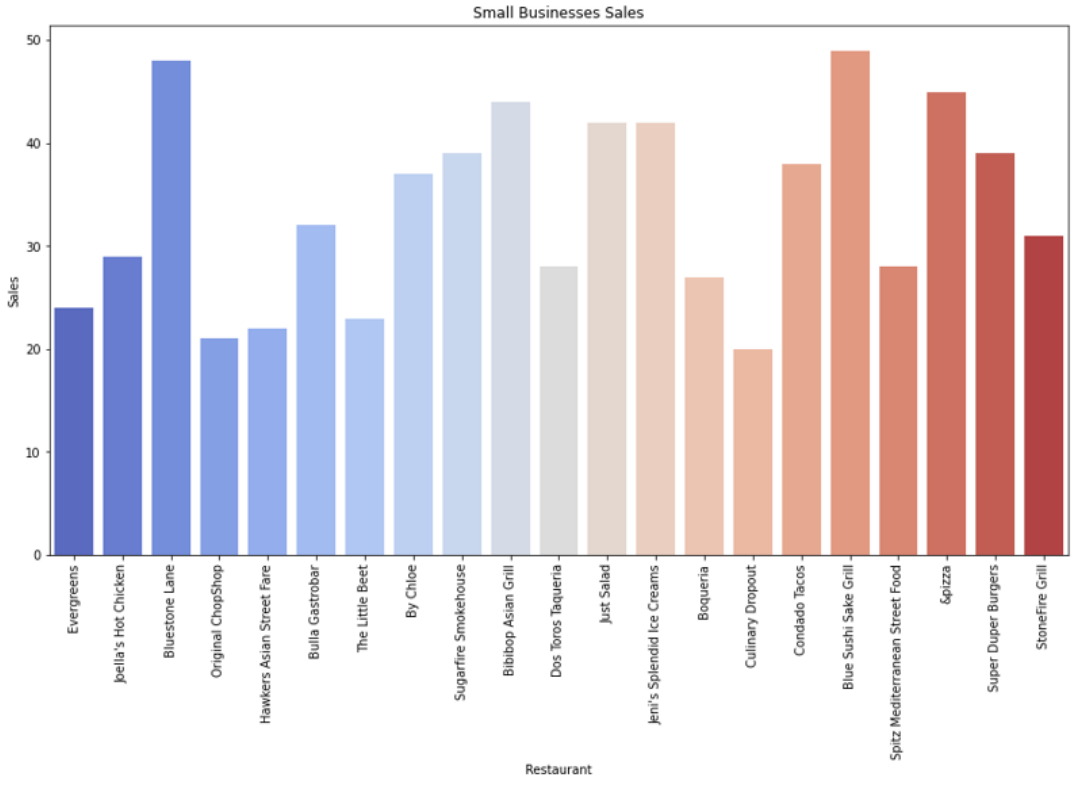
We do not have any time-related columns.

Data manipulation and visualization

In this chapter, we are going to show the visualization of our results.

```
smallbusiness = future50.loc[future50['Franchising'] == 'No']
```

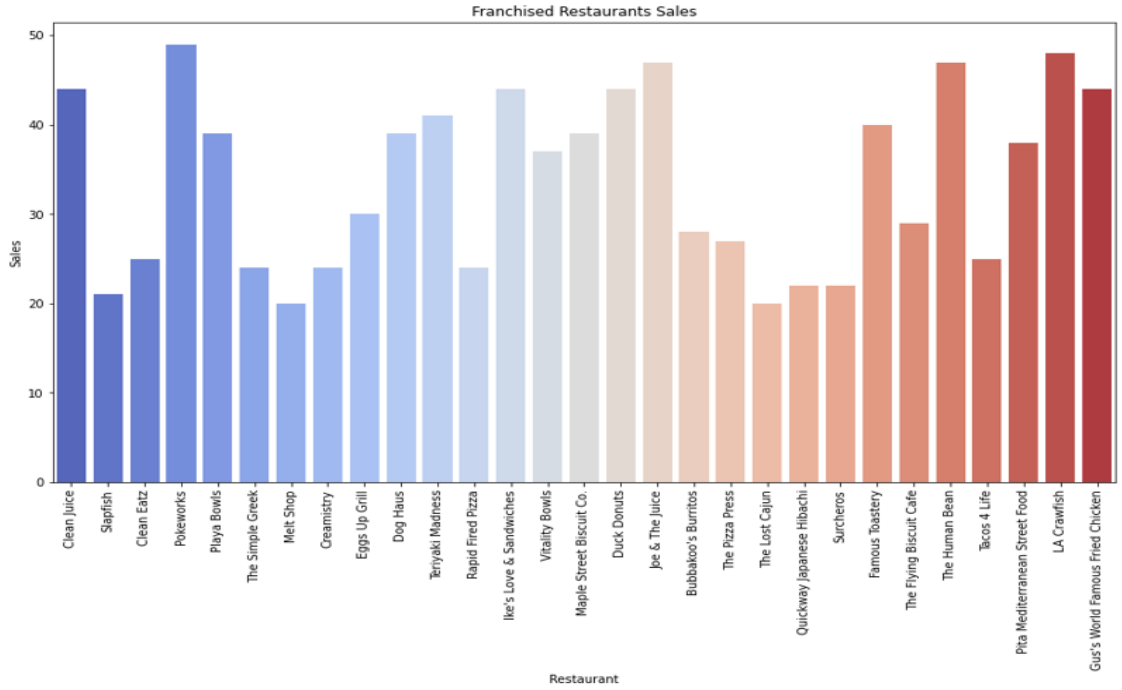
```
plt.rcParams['figure.figsize'] = 15,8
sns.barplot(x=smallbusiness['Restaurant'], y=smallbusiness['Sales'],palette="coolwarm")
plt.title("Small Businesses Sales")
plt.xticks(rotation = 90)
plt.show()
```



```
bigbusiness = future50.loc[future50['Franchising'] == 'Yes']
bigbusiness.head()
```

	Rank	Restaurant	Location	Sales	YOY_Sales	Units	YOY_Units	Unit_Volume	Franchising	YOY_S
1	2	Clean Juice	Chai otte, N.C.	44	121.9%	105	94.4%	560	Yes	
2	3	Slapfish	Huntii gton Beach, Calif.	21	81.0%	21	90.9%	1370	Yes	
3	4	Clean Eatz	Wilmin ton, N.C.	25	79.7%	46	58.6%	685	Yes	
4	5	Pokeworks	Irvine, Calif.	49	77.1%	50	56.3%	1210	Yes	
5	6	Playa Bowls	Belmar, N.J.	39	62.9%	76	28.8%	580	Yes	

```
plt.rcParams['figure.figsize'] = 15,8
sns.barplot(x=bigbusiness['Restaurant'], y=bigbusiness['Sales'],palette="coolwarm")
plt.title("Franchised Restaurants Sales")
plt.xticks(rotation = 90)
plt.show()
```



As you can see, even though some of the restaurants are not franchised, the small businesses also can have similar yearly sales during the pandemic time 2020. We can also see that average sales are from 20 to 30 million. Data can help to summarize insights and to make comparisons between the restaurants in your community. Moreover, this can help investors make financial decisions based on the information.

Interview

First of all, the interview questions were created to help us answering the research question and to gain more information about the topic:

1. What type of data are you using in your online community?

2. How are you collecting your data?

3. Do you think your current data is bringing some value to the community?

4. What kind of insights do you gain from your data that is beneficial for the community?

5. Do you use data security methods for the customer information?

- **If so, could you give examples?**

6. Do you use surveys to boost your customer satisfaction?

7. Do you believe the data can improve your community in the future?

We used email in combination with surveys to contact our target group which was digital communities in the Netherlands and USA. We asked them also to provide data if it is possible. In the end, we contacted around 35-40 communities but without any success.

Conclusion

In summary, we found that there can be different kinds of data in the digital communities. The most important thing that defines this is the goal of your community. Whether you are a digital market community or medical online community, the information that you gather will be different. For example, smart cities that we researched on, combine data from three different categories – economy, people, and environment, because they are focusing on how to be sustainable in the future. Their goal is to achieve long-term economic growth and higher quality of life, while minimizing the impact on the environment. Therefore, if Drive MKB project wants to focus on building self-sustainable community, they should focus on these three categories compared to the online city community. In the data quality analysis, we researched about restaurants that are collecting different data and they were focusing on economy and people part (sales and ranking from customers). In the end, we showed how the data can be beneficial for Drive MKB project because the main goal for them is to build digital community around restaurants and stores.

7 Sub-Question IV

"What would be the requirements of a digital community, in order to add value to the DRIVE MKB project?"

The project

The goal of the DRIVE MKB project is to support small to medium enterprises (SME's) in times of crisis, economic hardship and by doing so, also during times of economic stability/prosperity. Prompted by the COVID of recent years, retail and restaurants are sectors that have suffered especially under the crisis and the new (temporary) legislation endorsed by it. Although there had been a lot of creativity and entrepreneurship, to maintain turnover through home deliveries, limited openings and more, these sectors have shown they are less crisis resistant than their larger counterparts and have suffered severely. In 2020 one third of SMEs feared to be out of business without further support, before the end of the year (OECD, 2020) with all due economic consequences.

DRIVE MKB intends to support SME's by offering methods of digitalization. Many of these companies are severely less digital than their larger counterparts. Most small to medium businesses are ill prepared for a radical transformation on such a short notice. Gaps in digital capacity and infrastructure that existed prior to the outbreak remain, with rising threats on SME cybersecurity and data integrity. The increasing indebtedness of SMEs may pose challenges to the longer-term investments required to innovate, upgrade digital capacity, acquire new skills or reach out to new markets. Moreover, many entrepreneurs and SME employees are facing an extremely trying period, with serious consequences for their mental health and psychological well-being. Therefore, the focus lies with proving the technology readiness level of digitalization, starting a community, gathering education needs and gaining insight in the status of digital transformation of these branches. Low code applications have not yet been implemented or proven for these sectors, and a combination with an open-source community has certainly not been found. Furthermore, opportunities lie with automation of processes in general, and enabling entrepreneurs in the use of data, paving the way for making data-driven decisions. Here we intend to answer what the requirements would be for such a community.

The political climate

According to OECD, 2020, SME digitalization is recognized as a priority by many governments, as they move from management crisis to structural reforms and design recovery packages. In recent years a large mix of approaches has emerged to unleash SME and entrepreneurs' digital potential, while accounting for the great heterogeneity of the SME population and the diversity of their business ecosystems. The pandemic caused governments to look closely at this policy area, to ensure short term survivability of SMEs as well as to strengthen their digital prowess in the longer term. The Dutch government has focused on "SME Digitalization in response to the COVID-19 crisis", such as by advancing groundwork for empirical research to assess the e-

commerce surge by SMEs, showcasing experiences of SMEs undergoing accelerated digital transition, and promoting knowledge exchange on increasingly important themes like teleworking and digital security. They do so in a socialistic manner with a second focus on inclusion. A number of websites (Seniorweb, KBO-PCOB, De Koninklijke Bibliotheek, Stichting Lezen en Schrijven) are already investigating the reason certain groups do not wish to partake in the digital society, claiming a larger part of the Dutch society is elderly, and therefore a large part is anxious of digitalization.

For many SMEs, it is a big step to make good use of the opportunities offered by digitization. They simply lack time, knowledge and money. Hiring expensive ICT specialists or upskilling your own staff is not an option. That is why, on the initiative of the Ministry of Economic Affairs and Climate, the program 'Accelerating the digitization of SMEs' was launched. In this program, SMEs will work in so-called 'SME Workshops digitization'. The entrepreneurs receive practical advice from students from Applied Sciences, practical studies or Universities. These students are supervised by teachers and experts. All the while students map out the knowledge and innovation demand of entrepreneurs.

Rewards and incentive

Based on our observations at International Creative Woman, a thriving digital and physical community, rewards are what drives a community. On many occasions the owner of the community explained to us that they had a stop on accepting new members, due to the high demand. As we observed the community and its members, the incentive for joining the ICW became very clear. According to us, it can be distilled down to three major factors; social contact, access to events and knowledge/training. The reason one of the members attempts to get in contact always boils down to one of these incentives. The social contact mainly exists through the different channels ICW owns (Facebook, Instagram, Discord, and WhatsApp), and the event where the members meet physically. The way the members interact with each other and ICW observes as an informal and friendly manner of communication, and it solidifies itself as an incentive for people wanting to join communication within the channels. Within the social incentive is the networking incentive. As SME owners or start-up's, the members hope to find likeminded entrepreneurs to further their knowledge, collaborate or get in on the latest business strategies. The access to events appears to be their bestselling product, which after interviewing the owner, appears to be true. The events are always sold out almost immediately and people ask for it in advance. ICW is at a point where they have to tell people they can't join, due to the popularity of their markets or other SME enriching type of event. Access to these events alone is not only free marketing, but allows for a strong incentive to join the community, according to the employees and the members of ICW.

Self-sustainability

According to Foote (2021), size and growth are often natural indicators of whether an online community is sustainable and successful. Many of the benefits that people seek from online communities, such as information, entertainment, or novelty, seem to

increase with size. Works aimed at practitioners and researchers often use metaphors like a critical mass or network effects and assume that all communities seek growth, or at least that they would be better able to meet the needs of users if they grew larger. Despite this, small online communities still exist in droves. On Reddit, one of the most popular online community sites, small communities not only exist in great numbers but many persist in their smallness over time.

These persistently small communities challenge the assumptions underlying many online community design recommendations for how to recruit more participants, encourage more contributions, and retain more users: that growth is imperative and that small communities will either become large or die off. Why do so many communities remain small throughout their "lives"? What value do participants get from small communities and how do these benefits relate to community size? Our understanding of online communities would be enriched by a deeper understanding of how motivations, participation dynamics, and perceptions vary across communities of different sizes. Rather than growth being an unalloyed good, we suggest that some benefits can be obtained only through small communities and that users may intentionally seek out the kinds of experiences that small communities distinctly provide. In this study, we focus on the long tail of small communities, exploring how and why Reddit users participate in them, through a qualitative interview study. Drawing from conversations with twenty participants of various small online communities, this paper makes multiple contributions. First, we supply evidence that small communities provide qualitatively distinct benefits to their participants, such as expertise, trust, and a supportive community. Second, we find that small communities in our sample often provide participants with a sense of camaraderie or group identity but rarely serve as a source of dyadic relationships, contrary to what prior work would suggest. Third, we present a theory that small communities are enabled by and enable a robust ecosystem of semi-overlapping topical communities of different sizes and specificity. We end by reflecting on the role of size in online communities and the importance of examining and understanding communities across different scales of sizes.

The term "online community" covers a broad range of activity in the social computing literature, and many different types of communities have been studied. As a result, CSCW (2022) literature has used the term to describe entire platforms such as Slashdot, a social news and discussion site, as well as distinct groups within those platforms such as Usenet newsgroups, Facebook groups, and Reddit subreddit communities. Unsurprisingly, because online communities are so diverse in their scopes, purposes, and topics, the motivations for participating in them are similarly wide-ranging.

The role of size in community participation

Large communities seem to provide two main kinds of benefits through their size. They maintain a higher volume of activity, the ability to produce a sense of liveliness and maintain a flow of content that can attract and retain users. Secondly, they are drawing from a larger pool of participants, the ability to not only obtain diverse

knowledge and information from different participants but also in turn meet a broader set of needs. Maintaining a sufficiently large and active number of participants is a fundamental concern for online communities: if a community does not have enough active members, it will not have content for others to engage with, and the community will stagnate and eventually die. Activity is not just a basic existential concern, but something key to stimulating further engagement in the community: contributions, posts and questions, serve as a basis to trigger further responses for example with discussions and answers. This leads to potential new members being attracted to a community when they observe an active community with content that matches their interests. As such increased interactions between individuals via posts and comments in a community can increase an individual's commitment. For example, in a study on Yahoo! Groups (2022), Backstrom found that users who later went on to become heavily-engaged in a group were far more likely to have quickly received a response to their first posting. Moreover, because participation in online communities is generally tenuous, one can easily depart a community and never come back so therefore constantly recruiting more members is crucial. Continuously attracting new members can also create the impression that a community is lively and in turn, encourage participation from others. As a result, quantitative metrics of online activity such as the number of posters and commenters per day can serve as natural indicators of a community's success and are frequently utilized by researchers. A large body of research has focused on design mechanisms and strategies to stimulate growth in both size and activity. Underpinning this approach is the assumption that all online communities will try to recruit and retain members, that is, that they will try to grow.

Or put another way, communities that are meeting their members' needs will grow, because newcomers will not join, and current members will want to leave, a community that is unable to meet their needs. One of the most well-known frameworks for this kind of community growth is Kraut's Building Successful Online Communities (2012), which lays out a series of design suggestions for online community designers and managers. Derived from a rich body of research, these design mechanisms take up a top-down "social engineering" approach, wherein the basic assumption is that community managers can make design choices that will shape the community's success. This and similar work often directly or indirectly propose at least one of the following three goals:

1. Increasing the number of community members by attracting new members, crafting early experiences, and socializing newcomers.
2. Retaining existing community members via strategies to increase individuals' commitment to a community
3. Increasing contributions by and interactions amongst community members.

Two important concepts that have driven this idea of growth-as-success are network effects and critical mass. Network effects refers to the phenomenon in which the value of a good increases with the number of users and is generally used to discuss digital platforms more broadly but translates well. For example, on the peer production site Wikipedia, the more users contribute to and create articles the larger and broader a

repository of knowledge Wikipedia becomes and the less likely a potential contributor would choose to contribute to a rival online encyclopaedia. Similarly, communities like subreddits which rely on user contributions are likely to benefit if they become the centre of discussion about a certain topic. The concept of critical mass comes from theories proposing how to attain successful collective action and has been applied to interactive media and more specifically, online communities, as the idea that there is some key level of participation that allows a community to reach a critical mass beyond which the community will continue to grow (Raban, 2010). Many of the reasons that people have to participate in online communities, from entertainment to information-seeking/sharing, seem at first blush to be more compelling in larger communities, and it seems like users would naturally gravitate toward ever-larger communities. Thus, in social computing literature, small communities are seen as those that are either on the path to growing or failing.

Anonymity and privacy of participants

Because most communities consist mostly of public pages as well as viewable histories of a user's activity, it could be possible to identify a user, especially those in smaller and topically-unique communities. As a result, we modify, obfuscate, or omit details that could either identify the participants, specific users, or the subreddits in question. The stories and quotes below often reflect points and issues raised by multiple interview participants.

7.1 Conclusion

The question asked is; "*What would be the requirements of a digital community, in order to add value to the DRIVE MKB project?*". Based on the current pollical climate, the community will be welcomed by ruling instances. As we see the Netherlands invest in digital workshops and work with educational bodies to provide help on the matter, a school doing this on its own seems likely to be welcomed by all. Furthermore, it solidifies the demand for such a community with practical knowledge and a good network. So basically, the community is better of collaborating with the government and making use of their done research and resources. If only, they would make use of the already mapped demand of SMEs in the Netherlands.

List of recommended best practices

1. Collaborate with the government. Make use of their resources and understanding of the SME landscape.
2. Focus on incentive which should contain a product, access and a social incentive. The product as such, can be knowledge.

7.2 Research on subscription models

The question ICW asks us is how to go from asking no money, to a subscription tier which blocks off certain content if members decide not to pay. The struggle here, would be that the members all had full access before. As such, we located resources to

additional research on subscription models and we added a sub-section in research question four detailing our research into subscription models.

Subscription-based models are common in modern day businesses. The subscription-based business model is a business model that charges customers a recurring fee, typically monthly or yearly, to access a product or service. Due to the success of businesses like Netflix and Spotify, more and more companies are turning to the subscription business model to generate revenue. According to Gbaf News (2019), 70% of international business leaders say subscription business models will be key to their prospects in the years ahead. Subscription services are commonly found in the software and e-commerce industries, but new inroads are being made in other sectors as well. Subscriptions have become an integral component of our daily lives, changing the way we consume media and purchase goods. All of this seemingly driven by the consumers preference. As such 34% of all households will not have a normal tv subscription and by 2030 most of the world will subscribe to the ownership of a vehicle instead of actually purchasing one;

"...46% of consumers surveyed have stated that they would prefer buying a vehicle subscription service over buying [a vehicle] and if that holds true and consumers embrace the subscription model, this may be the start of something big." (Guthrie, 2019)

As subscription models are common practice it can be considered a futureproof business model for the years to come. It raises the question whether it is applicable for ICW in the coming future. The answer is most likely yes, since their target audience is of a low social economic nature, and therefore spreading out the necessary cashflow will either have to be on the investor side with interested stakeholders, or spread out over the larger group of interested consumers. A subscription service is a business offering to sell products or services on a set timeline, such as monthly or weekly. According to Vozza (2019) They come in one of three forms; curation, replenishment and access.

Curation

Curation is the most popular type of subscription offering. These can include items like clothing, makeup, or pet accessories. What makes these special is that the customer doesn't always know what they're getting, so surprising and delighting them is part of the experience. Popular curated boxes are Ipsy, Stitch Fix, and BarkBox.

As stated above, curation is mostly suitable for businesses that are goods oriented as opposed to service oriented. As such it is not likely that such a model will be implemented with ICW as they are providing a digital community, which is a type of service and all additional benefits are in the form of exclusive content offered in the community not any tangible goods.

Replenishment

Replenishment subscriptions come in second with consumers. This is a recurring order of consumable household goods, such as groceries or household supplies. Examples

include Amazon Subscribe & Save, which offers regular delivery of items like cereal or toilet paper, and Dollar Shave Club's recurring razor shipments.

As for digital communities, this model does not have many applications as it is more geared towards providing goods as opposed to services. However, in terms of ICW, they can utilize this model as a means of conveying detailed information to their members. This could take the form of having reoccurring deliveries to the members in the beginning of each week or month containing newsletters outlining any upcoming events or information that is useful for them. Moreover, deliveries could contain handbooks that document certain rules and regulations regarding starting a business and the possible ideas in terms of market-opportunities.

This model is not likely to be utilized by ICW due to the fact that most of their benefits come in the form of services and additional benefits to their digital community. Given that the replenishment model is leaning more towards goods than services and ICW do not really offer any tangible goods to their members, provides adequate reasoning as to why this model would not be implemented.

Access

Access is the final type of subscription. Customers pay for access to content or a premium service, like free shipping, for a monthly fee. Netflix, Amazon Prime, and online newspapers are examples.

The customers who opt to participate in communities with subscriptions usually have high expectations and they will want to see what added value they will benefit from. Ensuring that the access to exclusive content is valuable and not available for free elsewhere is key to convincing the customers to select an advanced subscription plan. One source stated that,

"The aim should be to over-deliver with exclusive content that keeps your members coming back." (Kanabar, 2019)

Furthermore, offering online courses or workshops to the members gives them a feeling of satisfaction that they are getting their money's worth for the subscription. It also provides them with the opportunity to improve on certain goals, which is what is being provided by ICW's community. However, at the current stage, ICW are offering these workshops at an extra additional cost as opposed to including them in a subscription model.

The research done on the three different subscription types show that the access model will most likely be the model on which ICW's subscription is based on. This is due to the fact that most, if not all, of the benefits provided by ICW will be granting access to exclusive content, information, and events to the members.

Implementation

According to Campbell and his "Guide to subscription models." (2021) the business model is versatile and easily adaptable for any kind of enterprise. It is simply a matter

of finding the right tools and strategy. Determining the approach and the implementation strategy boils down to five important pillars;

Determining your goals early

What exactly do you want to accomplish through subscription? More revenue, faster growth? Adopting this business model requires you to define these goals early on. This helps ensure you're building the best pricing strategy possible for your specific goals. When your recurring revenue is tied directly to the monthly or annual fees, long-term strategic thinking is important. These goals will then help you define how you build your buyer personas and structure your pricing tiers. Matching the features included in your tiers with the needs of different target customers helps you craft a better overall strategy.

Boost acquisition with a better experience

Simply put; It's important to maintain as low of a barrier as possible to sign up. Signing up for the subscription service needs to be as easy as possible, and avoid intimidating survey's, requirements and such. Currently ICW seems to invite interested consumers to an informal first sit-down, which is perfect according to Campbell (2021).

"A great customer experience will improve your acquisition numbers over time. When combined with a great overall onboarding journey, you'll also find a higher average willingness to pay."

The option to sign up should also be available in every manner of communication used. It's far easier to drive the growth of your company when a steady stream of customers is signing up for the service, regardless of where they're seeing you and your content. As such, a digital community providing the network as a service such as ICW is doing, should practice a stern barrier in communication. If the consumer wants to chat, advice or join an ongoing conversation/workshop, they should always be incentivized to sign up, or at least offered the possibility. Taking into account the intimidation factor, a free first tier seems likely when considering this advice. By doing so, the data and connection to the service is already made between the enterprise and the consumer.

Streamline the billing process

According to Campbell (2021) the payment option and the process tied to it should be as convenient as possible. As mentioned earlier the on-target pricing tiers suited for the target audience is important, but creating a difficult invoicing system might be an intimidation factor scaring away consumers or losing them over time. This ties into the idea that product experience is an important factor for successful subscription. Your customers must realize the value of your product or service every step of the way, especially when they're actively trying to pay.

Develop strong customer relationships

The subscription business model is dependent on strong and lasting customer relationships. If your customers aren't happy, or aren't reminded of the value your

service provides on a regular basis, they will cancel or reconsider. After all, they are now reminded monthly that they are paying for your services or product. Focus on retaining customers for as long as possible by fostering these relationships. This is where your buyer personas really shine. With an accurate portrayal of your customer base, it's easier to keep your company in line with their expectations. This not only requires a good experience, but reliable data on feature preference and overall willingness to pay. The more you know about the customer, the better your pricing strategy will be. It seems perfect for a community such as ICW, where the network and the relationship between consumers and to the company is the basis for subscribing to begin with. This should be seen as a second pillar of incentive along with the actual services provided, and separate goals should be set for each pillar.

According to Karklins (2021), it also entails to continuously attract new members. ICW seems to be at a member cap but the MRR generated from the subscription model should take away those limitations. A digital community should be prepared to re-invest in marketing and generating new interest. This might entail that generating marketing might even become more important than actual investments to a certain degree, the enterprise developing the business model should be aware of that.

Karklins (2022), also mentions that the two-way conversation should be maintained in order to create this healthy relationship. Create channels within your community where the subscription can be directly discussed, and the value for the customer is always up for debate. Customers need to be heard in order to become long term investors.

Plan for growth before it happens

A good subscription business model helps you scale. This steady stream of predictable income, evaluated against churn rates and operating costs, ensures the growth you project is sustainable. Without this knowledge, your growing customer base can quickly overload your infrastructure.

There aren't any other business models that provide this same kind of consistency. When you track monthly recurring revenue (MRR), annual recurring revenue (ARR), and churn rates effectively, it's easy to make adjustments as your company grows. That makes your company more agile and free to continue providing the best possible experience for the customer as well as your team. In the case of ICW, it would mean a higher maturity on the use of data, as well as a given business plan.

Understanding your cashflow, but especially the churn rate is important. Especially when the business is insecure about their implementation plan or marketing of the given subscription model, understanding the number of customers leaving or joining, and why can be the valuable input a company like ICW needs. It could tell them whether their strategy is effective on a longer period of time.

Defining the tiers

As of the start ICW indicated that they had a document already, containing the brainstorm results of subscription tiers and the benefits they intend to deliver upon.

The document can be found in attachment 10.1. When defining the tiers, we are, in essence, talking about a "Tiered Pricing". According to Chargebee (2022);

"Tiered pricing as a model (also known as price tiering) is used to sell your products within a particular price range. Once you fill up a tier you move to the next tier and you will be billed according to the number of purchases you make in those respective tiers. Tiered pricing differs as a model and strategy. Often both these terms are confused with one another."

A good example in our opinion is the multitude of SaaS companies active today. Many companies in the SaaS space most commonly have three tiers to differentiate the price points and some, even more. The main idea behind a tiered pricing strategy is that your prices and features should be tailored according to the various needs and use cases of the customers you're selling to. Many SaaS ventures who've acknowledged its worth have taken the reins to constantly innovate, experiment, and uncover the ideal pricing strategy for their business models. And among the many different ingredients that they employ in putting together a SaaS pricing model, is the "Value Metric"

Every company should put effort in, and be careful about deciding the value metric and the cost for the respective tiers. The value metric with which it sets its prices can be either quantitative, usage, feature sets or based on how your customers perceive the product. The number of tiers should allow you to capture the market by targeting different market segments without losing out on revenue. Basically, your pricing model and strategy could make-or-break your SaaS business; apart from the tangible monetary consequences, it is one of those intangible yardsticks that have a major share of influence on your customer's/prospect's perception of your business.

7.3 IT-Governance & Alignment

IT governance is an element of corporate governance, aimed at improving the overall management of IT and deriving improved value from investment in information and technology. IT governance frameworks enable organisations to manage their IT risks effectively and ensure that the activities associated with information and technology are aligned with their overall business objectives.

According to Nable (2021), these programs exist in both the public and private sector and are useful for any organization that seeks to optimize the way their IT function supports strategic business objectives. IT governance programs are especially prevalent in sectors like finance and technology where data collection is common and regulations are particularly rigid. Smaller entities may not have the budget or resources for a formal IT governance program—hence the need for MSPs to get essential IT governance in place for these customers.

IT Governance Frameworks

According to CIO (2022), there are three widely recognized, vendor-neutral, third-party frameworks that are often described as 'IT governance frameworks'. While on their own they are not completely adequate to that task, each has significant IT governance strengths:

ITIL

ITIL, or IT Infrastructure Library, was developed by the UK's Cabinet Office as a library of best-practice processes for IT service management. Widely adopted around the world, ITIL is supported by ISO/IEC 20000:2011, against which independent certification can be achieved.

COBIT

Control Objectives for Information and Related Technology (COBIT) is an IT governance control framework that helps organisations meet today's business challenges in the areas of regulatory compliance, risk management and aligning IT strategy with organisational goals. COBIT is an internationally recognised framework. In particular, COBIT's Management Guidelines component contains a framework for the control and measurability of IT by providing tools to assess and measure the enterprise's IT capability for the 37 identified COBIT processes.

ISO 27001

ISO 27002 (supported by ISO 27001), is the global best-practice standard for information security management in organisations. The challenge, for many organisations, is to establish a coordinated, integrated framework that draws on all three of these standards. The ISO 27001:2013 standard adopts a process approach for establishing, implementing, operating, monitoring, reviewing, maintaining, and improving an organization's information security management system. ISO 27001 was established by the International Organization for Standardization (ISO). It was first launched in 2005, as a replacement of BS 7799.

Protecting your assets

The standard takes a comprehensive approach to information security. Assets that need protection range from digital information, paper documents, and physical assets (computers and networks) to the knowledge of individual employees. Issues you have to address range from competence development of staff to technical protection against computer fraud.

- ISO 27001 will help you protect your information in terms of the following principles:
- Confidentiality ensures that information is accessible only to those authorized to have access.
- Integrity safeguards the accuracy and completeness of information and processing methods.
- Availability ensures that authorized users have access to information and associated assets when required.

ISO/IEC 27001 requires that management:

- Systematically examine the organization's information security risks, taking account of the threats, vulnerabilities, and impacts;

- Design and implement a coherent and comprehensive suite of information security controls and/or other forms of risk treatment (such as risk avoidance or risk transfer) to address those risks that are deemed unacceptable; and
- Adopt an overarching management process to ensure that the information security controls continue to meet the organization's information security needs on an ongoing basis.

ISO/IEC 27001:2013 is intended to be suitable for several different types of use, including the following:

- Use within organizations to formulate security requirements and objectives;
- use within organizations as a way to ensure that security risks are cost effectively managed;
- use within organizations to ensure compliance with laws and regulations;
- use within an organization as a process framework for the implementation and management of controls to ensure that the specific security objectives of an organization are met;
- definition of new information security management processes;
- identification and clarification of existing information security management processes;
- use by the management of organizations to determine the status of information security management activities;
- use by the internal and external auditors of organizations to determine the degree of compliance with the policies, directives, and standards adopted by an organization;
- use by organizations to provide relevant information about information security policies, directives, standards and procedures to trading partners and other organizations with whom they interact for operational or commercial reasons;
- implementation of business-enabling information security;
- use by organizations to provide relevant information about information security to customers.

Benefits of ISO 27001:2013

The benefits of standardization, and of implementation of one or more of the ISO 27000 series are wide and varied. Although they tend to differ from organization to organization, many are common.
The following is a list of potential benefits. As with many items on this website, this is an ongoing project. Please feel free to add further points via the comments option below.

Interoperability

This is a general benefit of standardization. The idea is that systems from diverse parties are more likely to fit together if they follow a common guideline.

Assurance

Management can be assured of the quality of a system, business unit, or other entity if a recognized framework or approach is followed.

Due Diligence

Compliance with, or certification against, and international standard is often used by management to demonstrate due diligence.

Bench Marking

Organizations often use a standard as a measure of their status within their peer community. It can be used as a benchmark for current position and progress.

Awareness

Implementation of a standard such as ISO 27001 can often result in greater security awareness within an organization.

Alignment

Because implementation of ISO 27001 (and the other ISO 27000 standards) tends to involve both business management and technical staff, greater IT and Business alignment often result.

Compliance

It might seem odd to list this as the first benefit, but it often shows the quickest "return on investment" – if an organization must comply to various regulations regarding data protection, privacy and IT governance (particularly if it is a financial, health or government organization), then ISO 27001 can bring in the methodology which enables to do it in the most efficient way.

Marketing edge

In a market which is more and more competitive, it is sometimes very difficult to find something that will differentiate you in the eyes of your customers. ISO 27001 could be indeed a unique selling point, especially if you handle clients' sensitive information.

Lowering the expenses

Information security is usually considered as a cost with no obvious financial gain. However, there is a financial gain if you lower your expenses caused by incidents. You probably do have an interruption in service, or occasional data leakage, or disgruntled employees. Or disgruntled former employees.

The truth is, there is still no methodology and/or technology to calculate how much money you could save if you prevented such incidents. But it always sounds good if you bring such cases to management's attention.

Putting your business in order

This one is probably the most underrated – if you are a company which has been growing sharply for the last few years, you might experience problems like – who has to decide what, who is responsible for certain information assets, who has to authorize access to information systems, etc.

How to achieve ISO 27001 certification – ISO 27001 implementation / Certification steps

- Gap Analysis
- Awareness Training
- Risk analysis
- Documentation Design and finalization
- Implementation
- Internal Auditor Training and conduct of the internal audit
- Management Review Meeting
- Review of Implementation
- Pre-assessment audit
- Stage 1 – certification audit
- Stage 2 – certification audit
- Award of ISO 27001 certification
- Continual improvement of the system through value-added consulting and training services

Domains of ISO/IEC – 27001

- Security policy
- Organization of information security
- Asset management
- Human resources security
- Physical and environmental security
- Communications and operations management
- Access control
- Information systems acquisition, development, and maintenance
- Information security incident management
- Business continuity management
- Compliance

7.4 Enterprise Architecture

According to Gilles (2020), an enterprise architecture (EA) is a conceptual blueprint that defines the structure and operation of organizations. The intent of enterprise architecture is to determine how an organization can effectively achieve its current and future objectives. Enterprise architecture involves the practice of analysing, planning, designing and eventual implementing of analysis on an enterprise.

Enterprise architecture helps businesses going through digital transformation, since EA focuses on bringing both legacy applications and processes together in an attempt to form a seamless environment. The use of EA frameworks rose in response to increases in business technologies during the 1980s, when a need for a way to respond to rapid technology growth was integral to business strategy. This process later expanded to the entirety of a business, not just information technology (IT). This way, the rest of the business would be ensured to be aligned with digital transformation.

Concepts of enterprise architecture are variable, so it will not look the same for each organization. Different parts of an organization may also view EA differently. For example, programmers and other technical IT professionals regard enterprise architecture strategies in terms of the infrastructure, application and management components under their control. However, enterprise architects are still responsible for enacting business structure analysis.

The importance of enterprise architecture

Enterprise architecture will help multiple departments in a business understand the broader business model and articulate challenges and business risks. Because of this, enterprise architecture has an important role in unifying and coordinating departmental processes across an organization. Being able to access and understand business capability should also help individuals identify gaps in their business, and from there, they can make more informed decisions.

Purpose and goals of enterprise architecture

The main goals of enterprise architecture may be to create a map or blueprint of the structure and operations of an organization. This blueprint should include information such as a map of IT assets and business processes.

Other common goals include promoting team alignment and standardization. This can be done in part by unifying environments across teams and organizations. Guidance is normally based on an organization's business requirements.

The enterprise architecture process

Microsoft's Michael Platt, a director in the strategic projects group, offers a view of enterprise architecture as containing four points of view: the business perspective, the application perspective, the information perspective and the technology perspective. The business perspective defines the processes and standards by which the business operates on a day-to-day basis. The application perspective defines the interactions among the processes and standards used by the organization. The information

perspective defines and classifies the raw data (such as document files, databases, images, presentations and spreadsheets) that the organization requires in order to operate efficiently. The technology perspective defines the hardware, operating systems, programming, and networking tools used by the organization.

The term may have various meanings to professionals in different areas who work with different EA frameworks. For example, programmers and other technical IT professionals regard enterprise architecture strategies in terms of the infrastructure, application and management components under they have control over.

High-level programmers will use enterprise architecture when referring to the hardware and software components in a design. For a website, that might comprise a web server, database, the NoSQL database cache, the API endpoints and the content delivery network.

For technical enterprise architecture descriptions, EA could revolve around the context of software architecture, systems architecture deployment types and other steps like testing.

Others could view enterprise architecture based on quality attributes. These are attributes that must exist for software to work and are unlikely to fit in a specification document. Examples include reliability, capacity, scalability and security. Quality elements are not functional requirements, but are ways to determine acceptable operating conditions and necessary trade-offs to get there.

Enterprise architecture, in a business context, may have organizations distinguish their enterprise architecture from the technical architecture required to build and run applications. Working from within an enterprise architecture framework will help define this.

Enterprise architecture models and methodologies

Enterprise architectures are typically implemented as frameworks. There are many different frameworks, and some will be a better fit than others when it comes to any one organization. For example, a framework focused on consistency and relationships between various parts of an overarching enterprise will be more helpful to larger organizations with many moving parts compared to small ones. In this case, a framework like the Unified Architecture Framework (UAF) may work.

Some example frameworks include:

- The Zachman Framework for Enterprise Architecture -- which covers six architectural points as well as six primary stakeholders that aid in defining and standardizing IT architecture components.
- Unified Architecture Framework (UAF) -- which is a complex but flexible enterprise architecture framework suitable for military and government software development as well as use in commercial businesses. It's implemented as a UML profile.

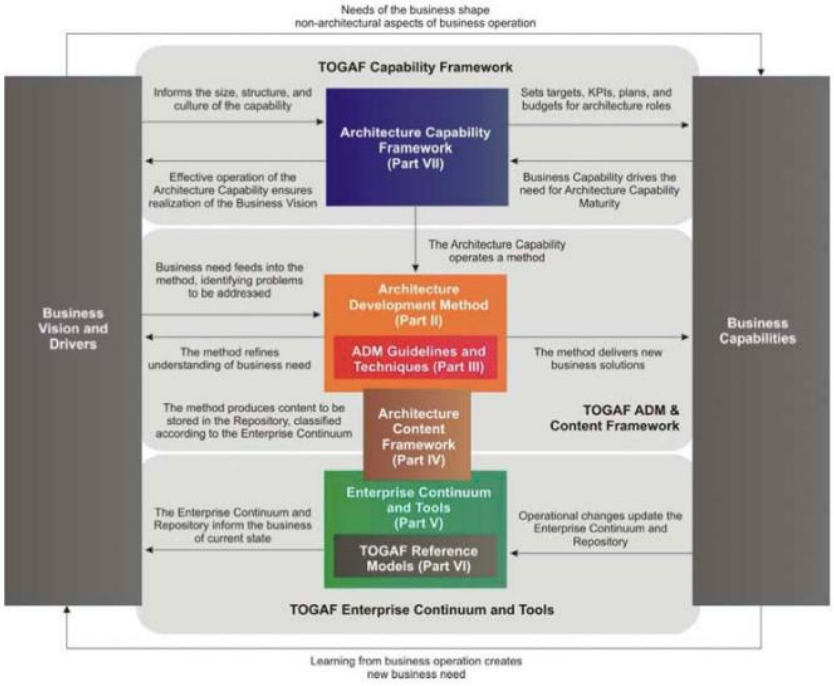
- Agile enterprise architecture -- which focuses an organization around a flexible, extended collection of structures and processes that can grow. It can become an important part to agile software delivery.
- Federal Enterprise Architecture Framework (FEAF) – which is a reference model that was introduced in 1996 for IT effectiveness. It was designed for the U.S. government, but can be used in private companies as well.

Other frameworks include The Open Group Architectural Framework, the European Space Agency Architectural Framework, the SAP Enterprise Architecture Framework or the Ministry of Defence Architecture Framework.

Benefits of enterprise architecture

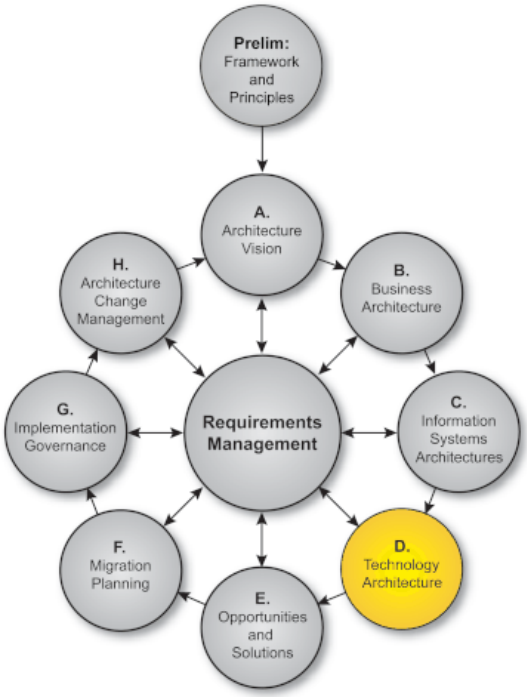
Possible advantages of having an enterprise architecture include:

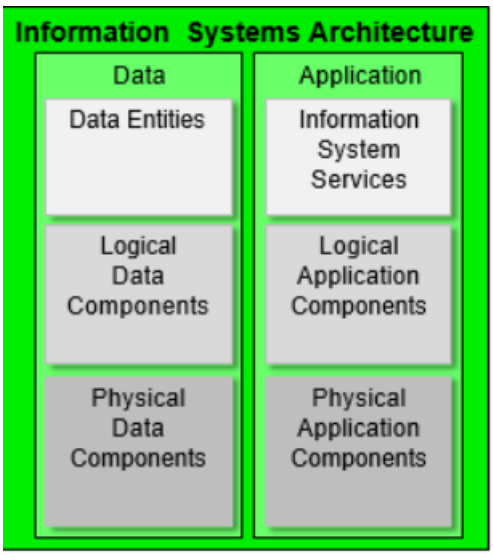
- Improved decision-making;
- Improved adaptability to changing demands or market conditions;
- Elimination of inefficient and redundant processes;
- Optimization of the use of organizational assets;
- Minimization of employee turnover;
- Support organization changes for redesigns and reorganization;
- Makes it easier to evaluate architecture against long-term goals;
- Can give views of IT architectures to those outside of IT;
- Can help with the unification of processes in IT;
- Can help simplify finance teams;

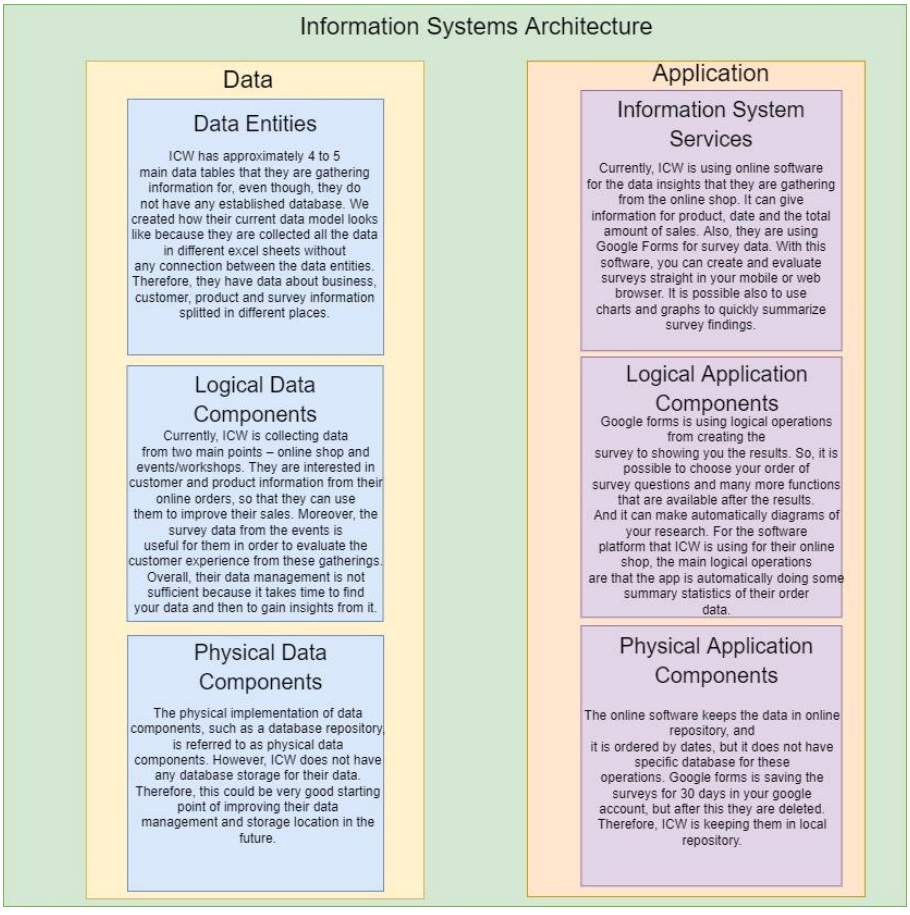


Due to the nature of TOGAF being applicable to smaller companies provided they place the benefits over the cost, we found it to be most applicable to ICW. We moved forward with investigating the TOGAF structure of ICW on a business & infrastructure level;

Information architecture

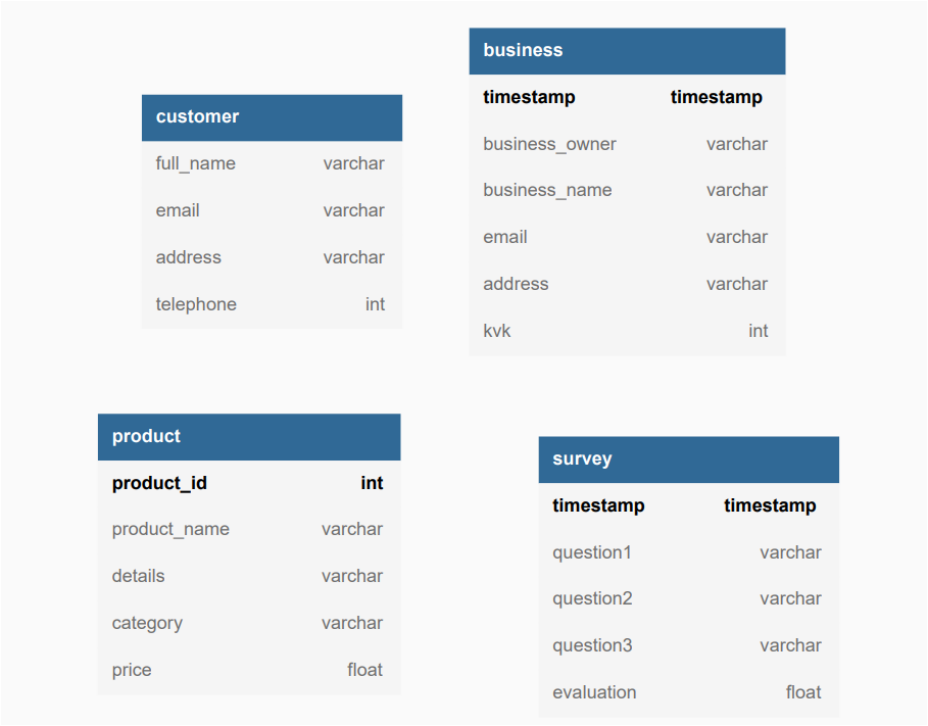



Information Systems Architecture
Data
Application
Data Entities
Information System Services
Logical Data Components
Logical Application Components
Physical Data Components
Physical Application Components


Information Systems Architecture
Data
Data Entities
ICW has approximately 4 to 5 main data tables that they are gathering information for, even though, they do not have any established database. We created how their current data model looks like because they are collected all the data in different excel sheets without any connection between the data entities. Therefore, they have data about business, customer, product and survey information splitted in different places.
Logical Data Components
Currently, ICW is collecting data from two main points – online shop and events/workshops. They are interested in customer and product information from their online orders, so that they can use them to improve their sales. Moreover, the survey data from the events is useful for them in order to evaluate the customer experience from these gatherings. Overall, their data management is not sufficient because it takes time to find your data and then to gain insights from it.
Physical Data Components
The physical implementation of data components, such as a database repository, is referred to as physical data components. However, ICW does not have any database storage for their data. Therefore, this could be very good starting point of improving their data management and storage location in the future.
Application
Information System Services
Currently, ICW is using online software for the data insights that they are gathering from the online shop. It can give information for product, date and the total amount of sales. Also, they are using Google Forms for survey data. With this software, you can create and evaluate surveys straight in your mobile or web browser. It is possible also to use charts and graphs to quickly summarize survey findings.
Logical Application Components
Google forms is using logical operations from creating the survey to showing you the results. So, it is possible to choose your order of survey questions and many more functions that are available after the results. And it can make automatically diagrams of your research. For the software platform that ICW is using for their online shop, the main logical operations are that the app is automatically doing some summary statistics of their order data.
Physical Application Components
The online software keeps the data in online repository, and it is ordered by dates, but it does not have specific database for these operations. Google forms is saving the surveys for 30 days in your google account, but after this they are deleted. Therefore, ICW is keeping them in local repository.

Data Entities

A data entity is a representation of a database table that is abstracted from its actual implementation. In normalized tables, for example, a large portion of the data for each customer may be maintained in a customer table.



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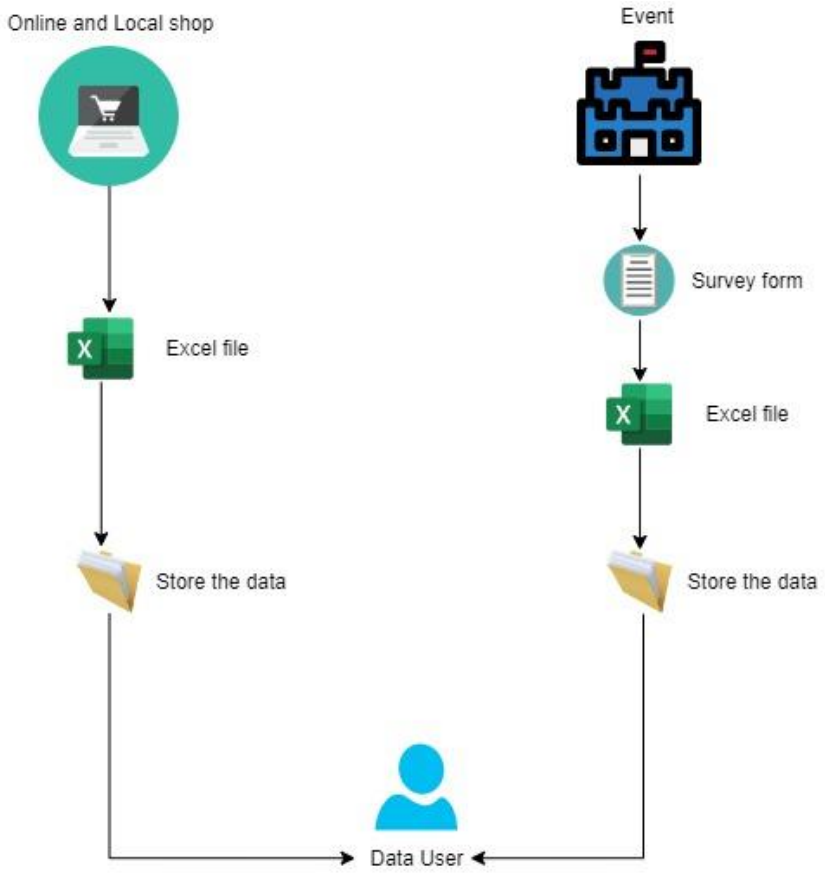
Logical Data Components

Logical data components are components that collect data at a logical level (identifying units that acquire and/or have data management responsibilities).



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Information system services

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Business architecture

1. Motivation

    a. Drivers: ICW have many drivers that motivate them to continue working hard to achieve all their goals and objectives. One of the main drivers are providing information to women that motivates them and encourages them to pursue small businesses. Another driving factor is that they are creating a strong community where people are free to express themselves and get information regarding any questions they might have. They are also motivated by supporting small to medium businesses and providing more job opportunities to help with unemployment.

    b. Goals: Their main goal is encouraging more women to pursue leading roles in small businesses to occupy their time in a more efficient and valuable manner. As a group of women, they feel it necessary to encourage others like them to start businesses to show-off their creativity and entrepreneurial spirit. They also want to constantly maintain a strong and healthy personal relationship with all of their members which is achievable if they maintain their current number of members.

    c. Objectives: They want to create a subscription method that can be implemented as soon as possible that will remain in place for as long as possible. This will help them have a more sustainable business model as by introducing a good subscription plan, they are getting a new source of inflows, which will help them better cover costs and fund additional events or future expansions. They also want to become self-sustainable to ensure their success to be able to continue to serve the women they

are seeking to motivate and educate on starting businesses and additional processes.

d. Measures: ICW need to begin understanding all of their running costs and how they are split up, as well as removing any unnecessary expenses if need be. By understanding these costs, it will provide them with essential insight which will help them create the subscriptions for their community. They also need to become more modern in their way of working by implementing more data solutions and keep an extensive database through constant data gathering practices.

2. Organization

   a. Organization: ICW are a small organization that has created an online community to help support other women to start their own businesses by encouraging them and providing them with relevant information. They have their main office in the Eindhoven however they are considering relocating to another location as their current one is unnecessary as the costs are high. Their community is hosted on Discord and is mostly free to their members. The term 'mostly free' here means that the entrance to the community is free, however any sessions, workshops, and/or events need to be paid for by the members. Due to having no entrance costs to join the community, they have very limited inflows and as such, their business model is not sustainable in the long-run, which is why they want to implement a subscription plan.

   b. Actor, Role: There are many qualifications that need to be satisfied in order to create and maintain a community such as the one made by ICW. Their team must have extensive knowledge about how to start a business, the pitfalls, risk management, and most common reasons for failure. These are essential topics that need to be well known as they will help all the women when starting their own businesses. The community also needs content experts in order to provide the other members more reliable answers to their questions. Based on the meeting with ICW, content experts are known in the community, however they are not labeled. A person can be labeled a content expert if they are able to prove that they have sufficient and accurate knowledge for their preferred subject matter.

3. Behavior

   a. Business Services: The service proved by ICW is extensive knowledge on starting a business and motivating more women to try and create their own businesses. They provide workshops and information sessions to give general information to the participants, as well as planning events for the members. All of these sessions are hosted on their discord community and can be accessed by the members. Their

digital community is a communal area where all members can freely share any ideas, concerns, questions, and/or answer other people's problems.

b. Business processes: The main process for ICW recruiting new members is a simple procedure that is accepted by all their current members due to the positive feedback received from them. The first step is that people contact them through their social media pages and ask them to schedule a meeting (coffee and idea session). During this session, the recruiter and the potential member engage in a discussion to get to know each other better. Finally, ICW evaluates whether the potential member would be a good fit for the community in terms of possible support or compatibility with the other members, then the final decision is communicated to them.

c. Products: ICW offer the digital community which is hosted on discord as their main product. In addition to that the workshops, sessions, and events are also offered as extra products which can help making the digital community experience much better. ICW also have a physical store which sells accessories and other fashionable items. These items could also be found on their web shop if people would prefer to place the order digitally. These are all the products offered by ICW and the selection is getting more extensive as they are growing.

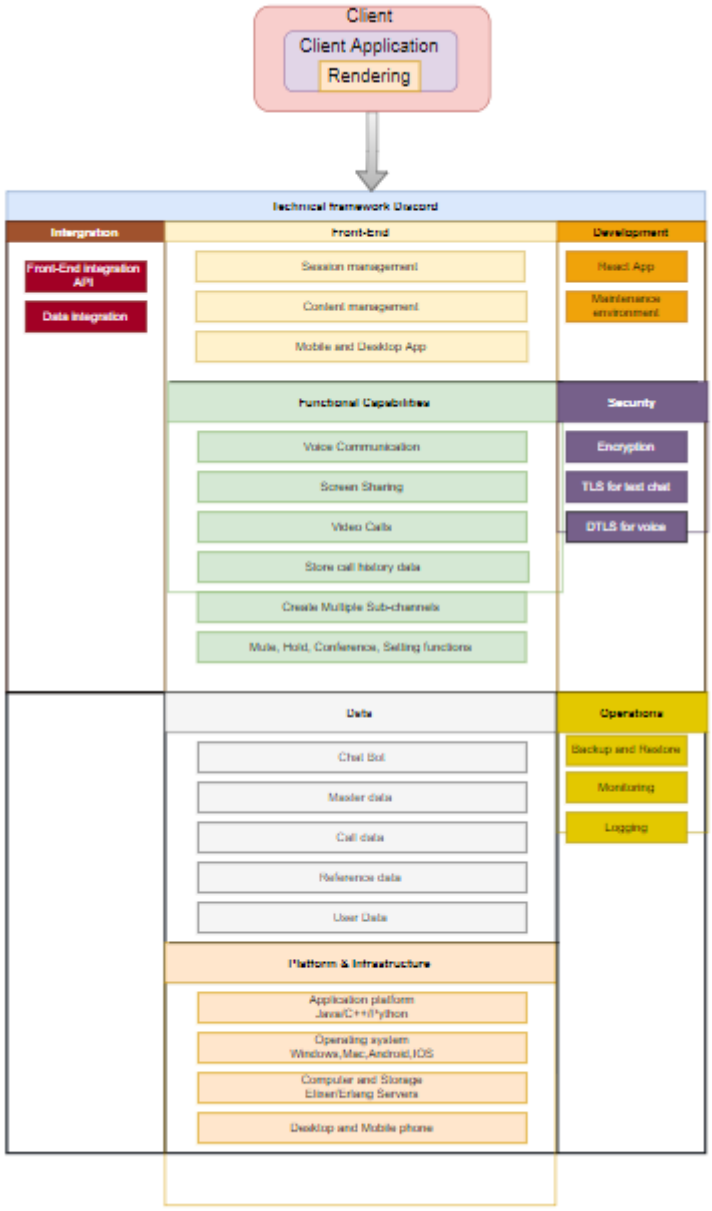
d. Business functions: Maintaining a community such as the one created by ICW requires multiple personal in charge of different business functions in order to ensure that the community is running smoothly. Some of these functions include marketing, sales, recruitment, accountant, content experts, and server owner. These are the basic business functions that are needed to ensure the community is running properly and all aspects contain experts.

The marketing function involves getting word out regarding the community to increase the number of members. This type of marketing could take many forms, however the relevant option for ICW at their current state is word-of-mouth as it is the lowest cost and ensures a screening process before recruiting a new member. Sales functions are there to help ICWs physical and online shops through setting prices in consideration of their running costs and ensures that the products have unique selling points to attract the attention of any potential customers. Recruitment is an essential function for ICW as they are ones who decide if the applicants for the community are accepted based on face-to-face sessions (Coffee & idea session) where they can understand the applicant's interests. This is done in order to ensure that the potential member is a good fit for the community. Furthermore, the recruitment and marketing functions are connected as the recruitment could provide a simple requirement list to make sure that the community is marketed to the appropriate group of people. The

accountant function is essential as they keep track of the community's finances to ensure they are able to survive and cover their running costs through their inflows.

Content experts are essential to the community as the present a certain degree of expertise when answering the member's questions, offering information seminars, and/or planning workshops. Finally, the server owner acts as the moderator of the community, whose responsibilities involve (but are not limited to) creating the community, setting the rules for the community, and invite the members to the community (Discord n.d.).

e. Business capabilities: ICW's current members on Discord are around 100 and they also have another 90 on WhatsApp. After talking with them, the preference regarding the number of members would be around their current numbers. This is due to the fact that ICW believe that as the number of members increase it will become unrealistic, that they would be able to have a strong personal relationship with each one of the members and they would become distant with the new members. They see the community as a type of family which can communicate about most things, which is an important factor that they value above anything else.


Client
Client Application
Rendering
Integration
Front-End Integration API
Data Integration
Front-End
Session management
Content management
Mobile and Desktop App
Development
React App
Maintenance environment
Functional Capabilities
Voice Communication
Screen Sharing
Video Calls
Store call history data
Create Multiple Sub-channels
Mute, Hold, Conference, Setting functions
Security
Encryption
TLS for text chat
DTLS for voice
Data
Chat Bot
Master data
Call data
Reference data
User Data
Operations
Backup and Restore
Monitoring
Logging
Platform & Infrastructure
Application platform Java/C++/Python
Operating system Windows,Mac,Android,IOS
Computer and Storage Elixer/Erlang Servers
Desktop and Mobile phone

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9 Attachments

9.1 Subscription tiers as defined by ICW

Membership ICW

`Model 1 No name yet	Model 2	Model 3
Access to whatsapp group Newsletter for entrepreneurs	Access to discord group* 1 coffee and ideas Your business listed in the directory with basic information **. Newsletter for entrepreneurs Official member badge to display in your website Invitation to ICW Annual Meeting Participation in Projects and Activities	Full Access to discord group * 2 Coffee and Ideas Business listed in the directory with full features* *. Priority Access to Markets 10% discount on Markets Newsletter for entrepreneurs Free access to webinars Free resources (curated useful information for entrepreneurs) 1 shout out in Instagram Feed 1 post on our FB page Publication of 2 articles in Howdo Magazine online *** 1 Instagram story about your business Official member badge to display in your website 1 hour Coaching session 1:1 Welcome gift
	*Limited to general channels ** Business name and 1 Link	*All channels open **Business name, 1 image, 1 link, description, tags *** Apply Terms and conditions
Free	49.99 6 month 85.00 Year	69.99 6 months 120.00 Year