# Kitchie - a social network for food sharing

Technical Addendum 1: The Communication Model

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| Version | v1.0.0 MVP Technical Addendum 1 (2016-01-17) |
| Slogan | Eat good food, meet good people. |
| Mission | Helps build communities around food sharing - giving people the reason to cook. |
| Vision | By 2020, Kitchie, through an ecosystem of different services, empowers 2 bn people to gain access to adequate food and water on an everyday basis - half of these people were poor as defined by the Global Multidimensional Poverty Index at the time when they first signed-up to the system. By 2020, users of Kitchie have a collective global carbon footprint of 1 bn Gt $CO_2$/year less than non-Kitchie users (based on available statistics). By 2020, testimonies from the majority of our users indicate that Kitchie has played a key role in increasing their general quality of life. By 2020, statistics indicate that neighborhoods where Kitchie's services are used actively by a slight majority of the population, constitute (with many exceptions) 'better livelihoods' than neighborhoods where Kitchie is not prevalent - in terms of public safety, economic activity and the general well-being of inhabitants. |
| Intention | With this paper we wish to share a central aspect of our project and attract developers or other individuals who wish to contribute in the successful development of this central aspect of the Kitchie service system. |

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## ABSTRACT

This paper is a technical addendum to the previous paper[6] that served as the introduction to Kitchie MVP v1.0.0. Where the first paper sought to present the project in general and attract interested individuals or sponsors, the purpose of this paper is to describe a central aspect in the Kitchie service system and attract developers who want to contribute in making this come true.

Our main argument as raised both in the previous paper and in the thesis of 2014[5], is that for a service to be successful, it needs to be able to *speak the language of the user*. Not just in terms of having Danish or English translations, but the entire frontstage of the service itself constitutes a 'language', and when users dont get the language, they cant communicate with the system and they drop the service. This is also our point of criticism for why existing solutions around commensality do not reach the level of user engagement that we think this subject area potentially allows for.

The Communication Model introduced in this paper is based on the Commensal Cycle as presented in [6] and introduces the concept of Characters as introduced in [5]. We then add the Languages as a third aspect and show that these three aspects can be used as parameters for a 3-dimensional coordinate system referencing all the contextual messages that the system is to present to the users. This representation allows us to separate between the references to any specific message and the message data. It allows us to separate between the message handler/engine and the data.

Because of the separation between the proposed general purpose engine to handle messages and the messages themselves, we propose to open-source the engine in a style similar to RedHat-Fedora, as a way to ensure the development and security of the engine in the longterm.

## Keywords

Communication Models, Social Networks, Service Architecture, Microservices, Service Oriented Architecture, Distributed Systems, Ubiquitous Systems, Open-Source Projects

Disclaimer: Although we are referencing a lot of scientific articles and books, this is not a scientific paper. It is a subjective, executive summary of a development project called Kitchie.

# 1. INTRODUCTION

The subtitle of this paper is "The Communication Model". Communication is central. It is central to people in coordinating anything in life, and it is central to Kitchie in coordinating commensal events between people.

Communication, in a way, is what 'creates' the user experience for people. People are different, we have different fingerprints, different voices, different genetic makeup, and different perceptibility - that is, we perceive the world differently, in ways according to our natural senses primarily and the concurrent thought processes (See also [9]). We are also different in the sense that, we are located in different physical places, it is not, strictly speaking, possible to *see* the world with someone elses eyes. We make sense of our existence by defining our specific place in it[7, p. 35].

This aspect, "making sense of the world by defining our specific place in it", we shall refer to as the frame (See also [2, chp.2 ]). The same 'thing' in the world can be perceived differently by different people because they perceive it from different frames.

What does all this mean for Kitchie or for existing services around commensality? With Kitchie we want to, as best as we can, ensure a good experience for each participant in the service. Ensuring a good user experience has to do with designing a service so it fits that specific user. In the thesis of 2014 we argued that in order to design a good service for an end user, we need to design the service so that it "speaks the language of the user"[5, p. i].

Our critique of most existing services[1] is that they, to various degrees, are just public displays for "presenting information" - websites filled with all kinds of dinner events from all over the world while the user with his or her specific food style and specific location, is tasked with filtering the events to find something that is relevant to them specifically. We think that this lack of engaging with users up front in a way that is meaningful to the users, is one of the main factors these existing services are not getting that level of widespread adoption that we think is possible around the subject of commensality.

The Communication Model presented in this paper is the foundation of Kitchie with regards to how the system is to interact with the user to maximise the chances of positive user engagement and experience. It is a system for managing all 'messages' sent from and to individuals for the purpose of navigating a passage to the situated dinner experience.

# 2. METHODOLOGY

## 2.1 Background to the Communication Model

In the MVP v1.0.0 paper (2015-11-22), we introduced you to a model that integrates the Food Cycle with the Commensal Cycle (See figure 1).

The Communication Model we here propose targets the Commensal Cycle.

[1]See EatWith.com, MealSharing.com, PlateCulture.com, MadRouletten.com, BonAppetour.com, or Cookening.com

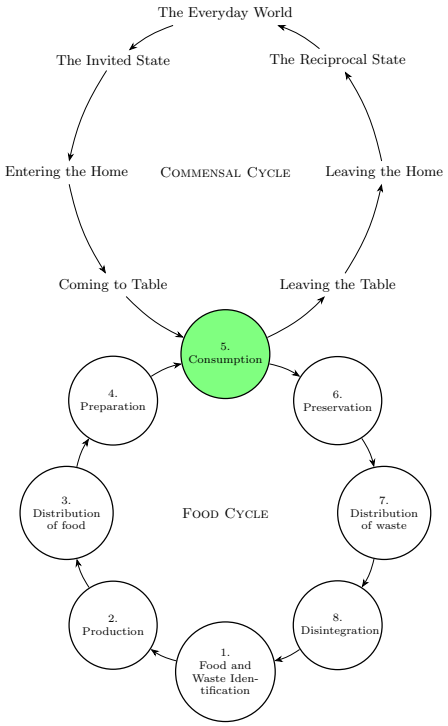


Figure 1: The food cycle and commensal cycle. MVP v1.0.0 targets level 5, the Consumption stage.

The communication model builds upon existing work done in food cultural studies and interaction design. The work by Beeman[3] lays the foundation of our model. He presents an argument for treating commensality as a cyclical behavior (a ritual), of 8 stages, and finds that this generalised model of commensality can be found across different cultures. In our own research that we did in 2014[5], one of our findings was a way to generalise the users of Kitchie. This was inspired by the concept of "purpose" as found in game theory literature[1] as well as the concept of "frames", as found in [2, 8]. Using this we created 4 characters embodying most of the "reasons" that we found users expressing during our user research. Table 1 summarise these aspects.

Table 1 presents what we can call the main parameters that are relevant to include in our Communication Model. To coordinate the 'where and when' of information that is to be presented to individuals to maximise the chance of positive user experience, we hypothesise that we at least need to have a very clear understanding of what Stage they are in, what their Character is, and what Languages they speak.

| Stages<br>The commensal cycle as found in [3] introduces 8 stages that an individual pass through for a commensal event. | Characters<br>The characters are generalisations of individuals with regards to their 'frames', the motive by which they enter Kitchie. These characters are based on the work found in [5, p. 87] | Languages<br>Language plays a crucial role in foodways, both formal and informal languages of the world[12]. |
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| **1. The Everyday World** "The world of everyday life is the scene and also the object of our actions and interactions."[11]. And as he further writes, the everyday world is not private, but is an "inter-subjective world, common to all of us, in which we have not a theoretical but an eminently practical interest." | **1. The Foodie** Who sees Kitchie as a way to gain new food experiences. | (all the languages of the world) |
| **2. The Invited State** Once an individual has been invited, they start to make preparations, scheduling other appointments, etc. | **2. The Socialiser** Who sees Kitchie as a way to gain new social experiences. | |
| **3. Entering the Home** When an individual arrives, they are greeted welcome by the host. They take off their coat and shoes that belong to the everyday world and enter a new liminal space. | **3. The Hobbyist** Who sees Kitchie as way to form ongoing relationships around a common interest. | |
| **4. Coming to the Table** When the food is ready, the host will call people to the table. The signal to eat. | **4. The Opportunist** Who sees an opportunity to use Kitchie for some other motive. Environmental gain, economic gain, adventure, etc. | |
| **5. Eating Together** | | |
| **6. Leaving the Table** When dinner is over, participants leave the liminal space with full stomachs. | | |
| **7. Leaving the Home** When greeting is over, participants greet goodbye and express their gratitude, taking the experience with them. | | |
| **8. The Reciprocal State** Carrying the experience with them back into the everyday world, they might invite back or invite someone else. | | |

Table 1: A table of Stages, Characters, and Languages in relation to commensality. These constitute the main parameters for the Communication Model.

To handle all this information, we need to make a very strong foundation for ourselves. What we propose is a form of vector space. We interpret those three parameters as parameters of a vector: Stages are represented by $x$, Characters are represented by $y$, and Languages are represented by $z$. Then we have the following:

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} \quad | \, x \in (1, \ldots, 8), y \in (1, \ldots, 4), z \in (1, \ldots, m) \quad (1)$$

With a vector space we have a coordinate system. This allows us to coordinate each specific message, or contextual information sent to the user with regards to the users journey in and out of commensality. A specific message could for instance look like this $(1, 2, 1)$ =Your friend Sam is hosting dinner tomorrow. 7 people are coming including your ex-girlfriend. Do you wanna join?.

What makes a user advance toward different stages of the cycle, is if they answer "Yes" at each preceding stage. The messages from the system are offers and suggestions and questions relevant to the stage they are in with the purpose of going full circle, but if the user does not reply positive they do not advance to the next stage.

Next we will look at how to implement the model. Based on coordinate system of messages we also see a potential to open-source the 'engine' that will be handling all these messages,while keeping all the specific messages proprietary to Kitchie.

## 3. IMPLEMENTATION

Now, we have discussed how best to present the model to an external audience, but what we have decided to go with is to borrow a piece of popular culture. We assume most of our audience knows the idea introduced with the movie The Matrix - a world in which the majority of the worlds people think they are living out there full lives, while they are in fact just interacting with a computer able to simulate all their sense experiences. Figure 2 tries to illustrate Kitchie as the 'computer' (backstage actor) coordinating all interactions with users for the purpose of commensal events.

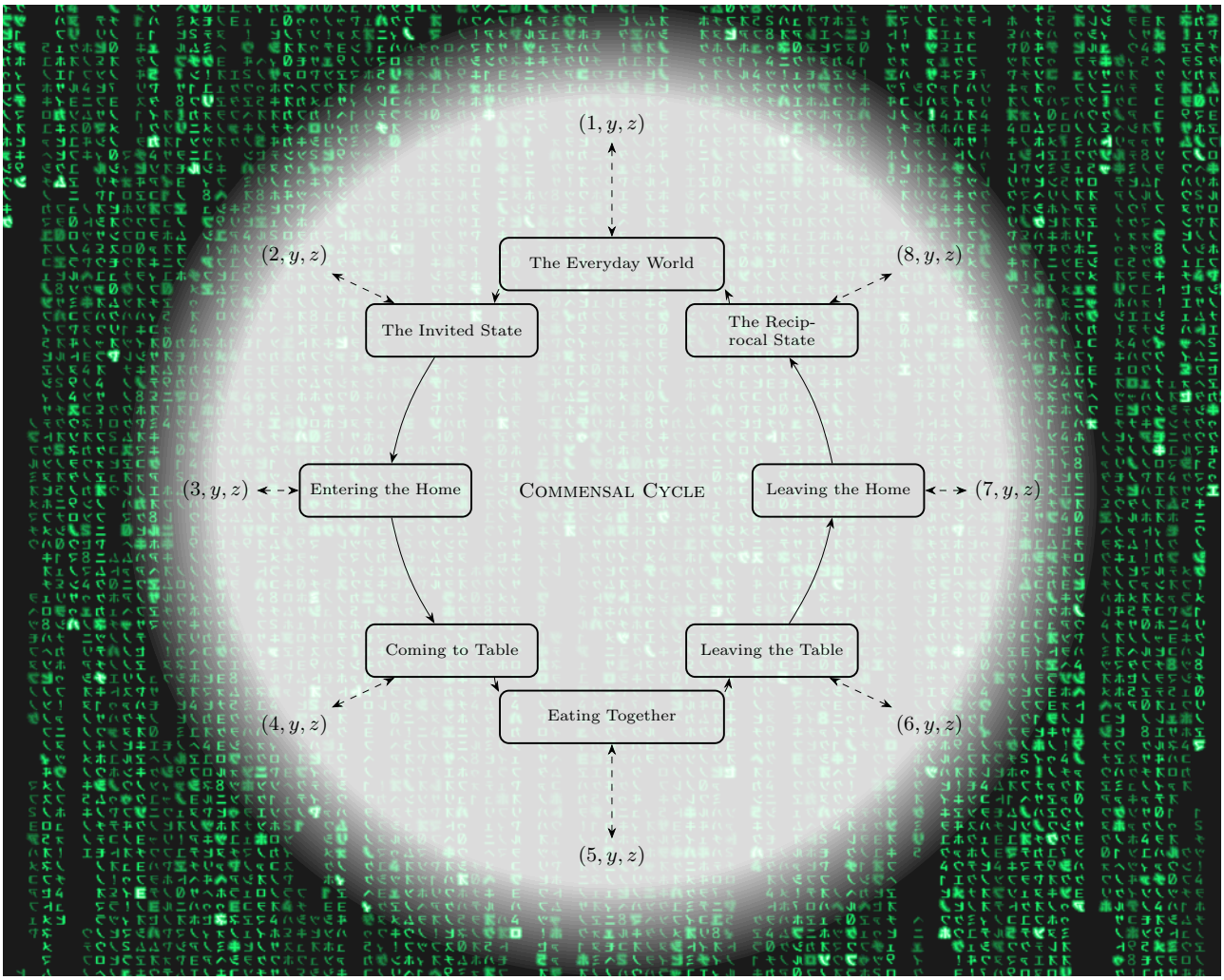


Figure 2: Kitchie is the backstage actor that the user interacts with in their individual journey in and out of commensality with other users.

The message we want to send by using this metaphor, is that with our introduction of The Communication Model, we want to make a framework that automatically assists people in and out of their journeys to commensality together with other people.

This is what we regard as our great difference between Kitchie and the existing services for commensality out there.

### *The Open-Source Potential*

The technical details regarding what technologies to use are not important now, but a thing worth noting again, is the division between the 'engine' and the specific messages themselves. Because our communication model is represented by a coordinate system, we envison that it will be possible to create an engine which only job is to pass coordinates back and forth to the user's touchpoint and the database backend. Then interpreters at both endpoints are able to use those coordinates to retreive the specific messages.

For our needs and where most of our work will go into, is in formulating the specific messages and finetuning the interaction with individuals, but the engine itself we see as something that could become it's own general purpose message handler useful for others as well.

The current plan is therefore that after creating a prototype version of the engine, and minimum 3 months after publication of the Kitchie service system, to open-source this engine.

The following is a list of technologies/products that might be relevant with respect to the development of the communication engine.

**Ethereum.org** provides a decentralized platform that runs smart contracts: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third party interference.[2]

**Zero Knowledge** systems show a way to design communication systems without the system ever having access to the information shared. [3]

**Storj.io** propose a method of having access to data on a 'cloud' of decentralised peers. It uses the blockchain to ensure privacy and transactions integrity.[4]

**Enigma.mit.edu** proposes a method of running application software on encrypted decentralised data. It is also based on the blockchain and incorporates some of the same concepts as Storj.io.

**Jolie-lang.org** is an open-source programming language for building microservices. It has the property of deadlock freedom by design which makes it an interesting candidate for use in the high-level definition of messaging in Kitchie.

**Jasper.com** is a leading IoT provider. IoT is all about ensuring messaging between thousands of different nodes, so maybe some of their experience also applies in our case.[5]

**Neocortec.com** is a technology company specialising in ad-hoc wireless mesh networking. Again, this is about message propagation which will be of value in the development of Kitchie.

**BRCK.com** is a connectivity device for providing internet and mobile access and services among urban and rural people where existing ICT infrastructure is flaky. Designing the engine to be incorporated in the application stack of BRCK could act as a fallback route for Kitchie.[6]

**Pervices.com** is a manufacturer of Software Defined Radio (SDR) solutions. SDR allows connectivity devices to switch between different frequencies as needed to ensure connection. Using Pervices products could also act as fallback options for Kitchie.

**TeleHash.org** is an internet protocol for mesh networks.[7]

**Bigraphs** as used by Robin Milner[10] is a theory for modeling communicating agents in space and motion. It provides a rigorous conceptual framework for keeping track of interactions in a system like Kitchie.[8]

**Environmental WSN[4]** was a research project form 2010 that compared existing technologies for creating Wireless Sensor Networks. Their contribution was an operating system for WSN that performed better than existing. Especially message propagation was an important aspect for them, as it will be for Kitchie.

**OpenGarden.com** is a proprietary technology company using WiFi direct to create different mesh-based services and products. Their flagship product was the FireChat app by which users can chat without internet access.

**FB Messenger, Google Allo and Amazon Echo** are end-user touchpoint platforms that enable developers to build different communication agents on top of them. This might be a way to prototype the Kitchie communication model, but Kitchie should not be restricted to work on these only.

[2] See also Stellar.org which is also based on blockchain technology, but focusing on payment systems.

[3] See for instance SpiderOak's Semaphor for an example. https://spideroak.com/solutions/semaphor

[4] Storj.io is in the category of P2P applications together with Enigma, TeleHash, and there are many other projects. See https://gist.github.com/moshest/aea88f152fac89e1c526

[5] Alternatively, RIOT could also be worth investigating http://riot-os.org

[6] See also ServalProject.org and Osmocom.org as possible variations.

[7] See also Hyperboria.net

[8] See also WorkflowPatterns.com and YAWL as variations.

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