

HUMANE

White paper

Roadmap for human-machine networks in the sharing economy

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| Abstract | This white paper presents a roadmap for human-machine networks in the sharing economy. Considering sharing economy services as human-machine networks allows us to discuss these services from the perspective of the involved actors and the relations between these. In particular, we discuss the need for addressing motivation and behaviour change, as well as the potential benefit of standardising sharing economy service processes. We also discuss the benefit of data-driven predictions in sharing economy networks, as well as how trust is established in such networks. Finally we discuss aspects pertaining to the extent and structure of sharing economy networks. In particular, we note the possible growth towards a winner-takes-all market, and the role of service delivery networks in the sharing economy. The roadmap is based on an interview study involving 19 service owners, researchers, and policy maker representatives. |
| Key-words | Human-machine networks, sharing economy, roadmap. |

Disclaimer

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Introduction

The sharing economy¹ is expected to see substantial growth in Europe the coming years. From today's estimated value of sharing economy transactions at 28 billion Euro to an estimated potential value of 570 billion Euro in 2025 (PWC, 2016).

Analysts see the sharing economy as a “deep socio-economic trend” which significantly will impact society. Key drivers of this trend include developments in networked technology, technology savvy and openness in the European population, and a drive to monetize idling resources (PWC, 2016).

Based on this analysis, the European Commission has pointed out the high potential for new businesses in this market (European Commission, 2016). The potential of the sharing economy has also been pointed out by academics (Belk, 2014) and consultants (Botsman & Rogers, 2010).

Nevertheless, important challenges remain on the road from the sharing economy as an emerging current phenomenon to sharing being established as a mainstream mode of consumption in the European population. Only about one fifth of Europeans had used sharing economy services in 2016, and nearly half were unaware of such services (TNS Political & Social, 2016). While a small number of actors, such as AirBnB and Uber², are established on a global level within sharing economy areas such as hospitality and mobility, a wide range of start-up companies with uncertain futures aim to take on new market areas.

We need to strengthen our understanding of how to actually realise the potential of the sharing economy and establish it as a mainstream mode of consumer behaviour. As a step in this direction, we have conducted a study to map out the challenges and opportunities ahead. Here, we present a roadmap resulting from this study.

About the study

The study is based on 19 interviews with sharing economy service owners (9), researchers with a special interest in the field of sharing economy (6), and policy maker representatives (4). The study was conducted in the context of Norway, which is useful given the prominence of sharing economy services, the high quality of the digital infrastructure, and the substantial digital literacy in this country. Hence, we assume that findings from Norway may be seen as indicative of the current or future state of sharing economy services across Europe.

As a theoretical basis for the study, we have applied a framework for analysing human-machine networks developed in the HUMANE project. The framework is particularly suitable, as a key characteristic of sharing economy service is their networked character in which the collaboration of human actors is enabled by intelligent digital platforms.

¹ Also referred to the collaborative economy, e.g. in COM 2016

² Whether Uber is a sharing economy service or not is much contested, see e.g. Botsman (2016). We will not pursue this discussion here.



Roadmap overview

To gain insight into how sharing may be established as a default mode of consumption in the European population, we discuss the humane-machine networks of the sharing economy from different perspectives: The networked actors, the relations between these actors, the extent of sharing economy networks, and the network structure. These perspectives reflect the analytical layers of the HUMANE framework. In addition, we address the societal aspects of sharing economy.

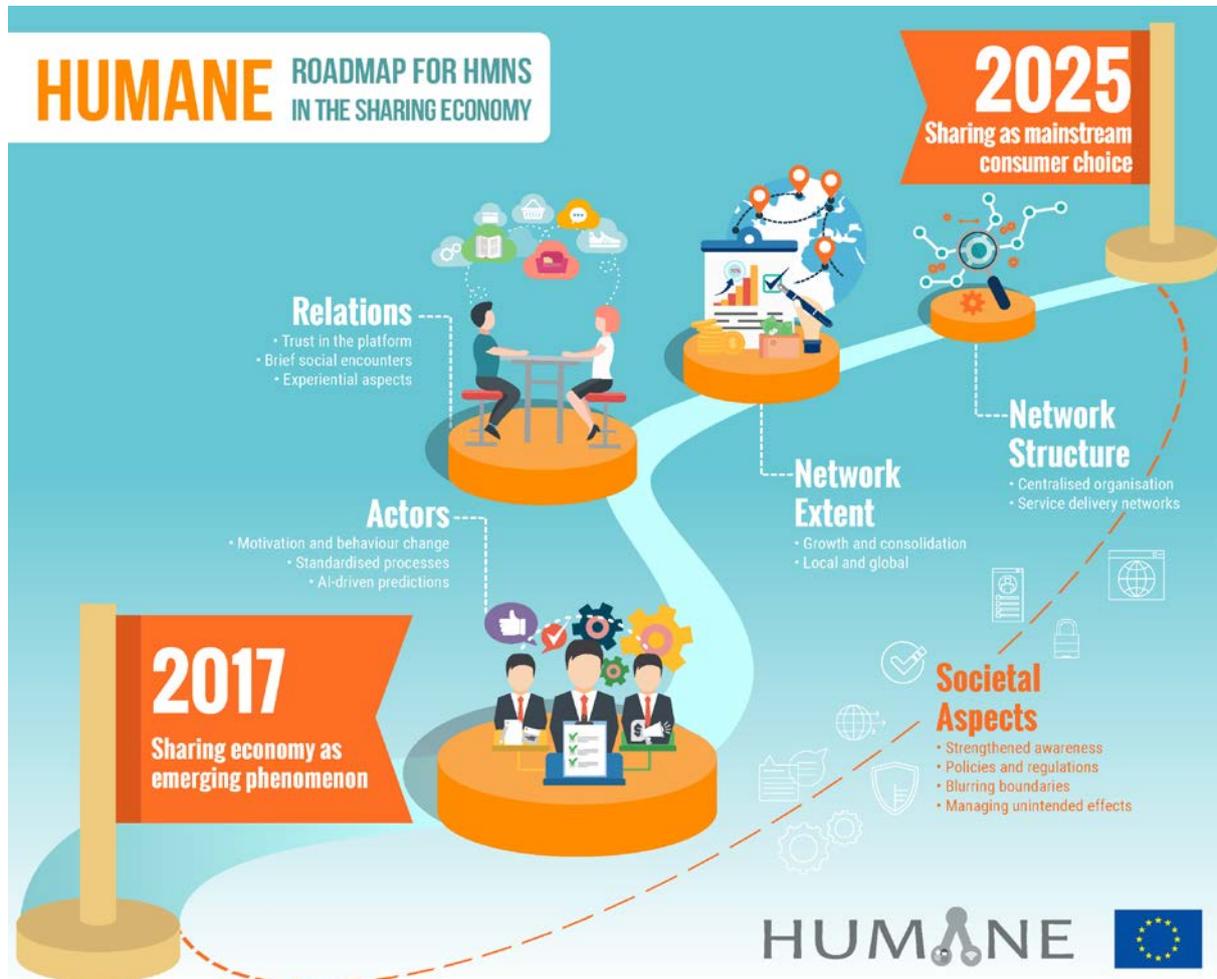


Figure 1: Sharing economy roadmap overview

Actors: Convenience through predictions and standardising processes

In the HUMANE framework for analysing human-machine networks, we consider two types of actors: humans and machines. In sharing economy services, this is a useful distinction which helps us understand the dynamics of sharing economy services. First we consider issues pertaining to human actors, that is, the havers and the seekers, the suppliers and those with a need.

Motivation and behaviour change: Key to sharing economy service owners, is the motivation and behaviour change required to make people change their consumption pattern towards sharing. Overcoming the barrier of needed behaviour change is seen as critical for growth in sharing economy services. Behaviour change is in part achieved through motivation, by leveraging the right incentives. Financial gain and convenience were seen as the key motivators for consumers. The service owners

also accentuated the potential added value of experience and sustainability, but saw these as clearly second to financial gain and convenience.

Behaviour change can also more easily be achieved in consumers that are in a transition phase, or in market segments where sharing behaviour is already an established practice. For example, it may be easier for a young adult who has not previously owned a car to engage in car sharing, by relying on access only or by lowering the cost of a new car through making it available for rent, than for an established car owner. Also, in some professions such as photography, renting and borrowing equipment may be an already established practice which may be tapped into.

Standardised processes: Whereas the Internet is often seen as an arena of potential personalisation and unlimited choice, the service owners of our study accentuate the need to limit consumer choice and establish standardised processes in the sharing economy services. This to strengthen quality control. Whereas start-up services may to a larger degree rely on leaving it to the consumers to figure out how to present their goods or services, how to communicate, and how to share, and how to transfer payments, efficient processes are seen as key to make the consumer experience efficient and enjoyable. To make sharing convenient, a key motivator for consumers, human agency needs to be reduced.

AI-driven predictions: While seeing the need to reduce human agency in sharing economy services, service owners at the same time see the need to strengthen the agency in the digital platforms. For sharing economy services to serve as convenient and easy to use alternatives, the platforms on which they are based need to provide strong support for automatic matchmaking and recommendations. This is for example seen in recent applications for redistribution markets, such as American LetGo or Norwegian Snapsale where ease and convenience is strengthened through, e.g., automatic image recognition so that sellers get automatic support in categorising and writing their ads, and prediction capabilities to provide relevant suggestions to potential buyers.

Interestingly, data and data processing then becomes a competitive advantage in sharing economy services. Successful services will need to be leading in data analysis, in particular in the emerging domains of artificial intelligence and machine learning. Furthermore, successful services will need access to sufficient volumes of data to enable predictions.

In future sharing economy services, the agency bestowed in digital platforms will likely increase while the agency left for the human actors will be reduced. However, service owners may benefit from providing alternative levels of digital agency. Some consumers will want to manually explore all available options, while others will want to be given the estimated best option to optimise convenience. Such differentiation may be provided through product categories with different levels of flexibility.

Relations: Matching strangers through trust in the platform

Understanding sharing economy services as human-machine networks implied investigating the relations between the humans in the network, as well as the humans and digital platforms.

Trust in the platform: Trust is accentuated as a key issue in sharing economy services, by service owners, researchers and policy maker representatives alike. A number of mechanisms to build the trust needed for people to share housing, transportation, and goods are identified. Examples of such mechanisms include social rating and recommendation systems, insurance services, authentication systems, traceability in transactions, and adequate privacy policies. While in pre-Internet times trust was dependent on social ties, in the sharing economy trust is seen as depending on the platform. The success of sharing economy services is seen as depending on the degree to which the platforms are trusted by the consumers to provide adequate recommendations and matches, not the platforms ability to build social ties between its consumers.

Matching strangers: Interestingly, the service owners report on little incentive to strengthen social ties between the users of the platforms. Rather, the default approach is to match strangers. Arguably, it may be counter-productive to strengthen social ties, as this in the long run may compromise social recommendation and rating systems.

The experience in the meeting with strangers: At the same time, the experience involved in social meeting with fellow consumers as part of the sharing process is seen as a potential added value in sharing economy services. While consumers start using sharing economy services for economical or convenience reasons, some may stay loyal for the positive social experience. At the same time, others will likely prefer to opt out from the social aspect of sharing.

Successful sharing economy services in the future will build trust in the platform, use AI-powered prediction capabilities to successfully match strangers, and provide the optional feature of the social experience – to be chosen or chosen away at the discretion of the individual consumer.

Extent: Growth towards a winner-takes-all market?

In the HUMANE framework, we consider the size and geographical reach of human-machine networks. Sharing economy services typically strive for international reach and massive market shares. However, given the great underwood of start-ups in the sharing economy, not all services can become the AirBnB of their market.

Growth and consolidation: Sharing economy services depend on large bases of active consumers. The revenue for each transaction is small. Hence, large volumes are needed for profitability. Furthermore, the convenience of the service depends on size. Without sufficient uptake, the goods or services offered for sharing will be too diverse or fragmented to be of interest. Also, large volumes of transactions are needed to develop the needed prediction capabilities in the digital platform. No wonder, then, that service owners plan for growth. Growth in several parallel services may for a while be sustained by the increasing volume of the sharing economy market. However, as suggested by several of the participants, consolidation will soon follow. Possibly towards winner-takes-all markets.

Local and global: While sharing economy services typically depend on growth, the same services are often deeply embedded in the local context. Sharing of idling goods and skills often require

geographical proximity, whether it is the sharing of a power-tool or the sharing of idling work capacity for mowing a lawn. Service owners are aware that the services need to fit the local context. At the same time, the services need to scale across geographies. Local adaptations may be useful in the short term, but detrimental in the long. A principle of developing services for future scaling across local context will be useful.

In the future, sharing economy services need to grow to survive, which typically implies scaling on an international level, possibly in a winner takes all market. However, the successful ones will be able to do so without losing relevance for with the local context.

Structure: The platform as the central node, incorporating service delivery networks

The final perspective in the HUMANE framework is the structure of the network. In particular its degree of bottom-up vs. top-down structure. Self-organized vs. centralized or hierarchical.

The platform as the central node: Sharing economy networks, while depending on a broad popular uptake, are organised around the digital platform as a central node. This mode of organisation is accentuated in that the service owners have little incentive to develop social ties between consumers, but rather to match strangers.

Incorporating service delivery networks: Though, in spite of its centralized character, sharing economy services are often formed as service delivery networks where different commercial actors take on different parts of the service provision. For example, in an online redistribution market, the marketplace may depend on third party services to provide payment, transportation, or communication. It may even be up to the consumer to decide on which third party services to use.

As part of growing into mature and comprehensive platforms, sharing economy services will need to be in control of larger parts of the transaction process in which the customers are involved. The strength of leading global sharing economy platforms is that these host all needed services. Becoming a trusted platform for sharing is likely to require that the platforms can be held accountable for the components of the sharing process. Such control may, however, never be perfect as the service owners depend on matching consumers that are non-professional.

Societal aspects: Awareness, policies, and change

The human-machine networks of the sharing economy are embedded in society. Hence, a roadmap for sharing economy services need to consider societal aspects, though these are not explicitly addressed in the HUMANE framework. On the basis of the interviews, the following aspects are of particular relevance for future sharing economy services.

Awareness: Growth in the sharing economy require awareness among consumers. Service owners point out their current greatest competitors are not other sharing economy services but consumers tendency to use traditional providers. Hence, being the first mover in a market may not be an advantage. Rather, several actors may be beneficial to strengthen awareness in the concept. It is still the early days of the sharing economy.

Policies and regulations: As the sharing economy matures, policy and regulations need to follow suit. Policy change may be needed to facilitate the establishing of sharing economy services. Also, given the

opportunity for transparency provided through the digital platforms of the sharing economy – where all transactions and interactions leave digital traces – government policymakers now may have a golden opportunity to require transparency and reporting from the platforms, e.g. for simplified tax deduction. Policy change may also be required to curb societally undesirable side-effects of sharing economy services.

Blurring boundaries: As the sharing economy grows, it is expected to blur into other markets. Approaches from sharing economy services, such as intelligent and flexible offering of access rather than ownership, will likely increasingly be taken up by traditional service providers. And sharing economy platforms may also converge towards traditional service providers, for example driven by the need to standardise sharing processes. The interviewed researchers note on the challenge to clearly define sharing economy services. This will likely be more challenging in the coming years.

Managing unintended effects: Being a disruptive approach to service provision, the sharing economy is bound to introduce unintended effects. As, for example, when sharing demand outweighs sharing supply, and the platforms for sharing no longer serves to facilitate the sharing of idling resources but rather drives demand for new resources – as is for example seen in the concern voiced for visitor takeover of popular tourist destination due to the efficient sharing of private homes (Slee, 2016).

Timeline

We have in this roadmap identified challenges and opportunities related to the sharing economy as it grows from the current state of emergence to a future state of sharing being a default consumer choice. Such maturation may possibly be expected in 2025, given that the estimates for growth in the sharing economy cited initially in this roadmap hold.

A detailed timeline for addressing the challenges and opportunities discussed in this roadmap is challenging. In particular given the rapid change in this field. However, a tentative, high-level ordering is suggested in the overview figure (Figure 1).

In particular we suggest the challenges and opportunities associated with the actors of the sharing economy networks to be highly prioritised. Sharing economy services need to prioritise motivating consumers, in particular through leveraging economical and convenience motivators. At the same time, the experience of the meeting between fellow consumers should be retained as a value-adding feature. Also, strengthening prediction capabilities in the digital platforms needs to be prioritised – as do the access to data – do support matchmaking and recommendations.

Societal aspects are slower to address and hence seen as later in the timeline. This does not mean that action has not started. On the contrary, the communication of the European Commission on collaborative economy (European Commission, 2016) advice that this represent an opportunity for policy makers and legislators in the member states. In particular, we see it as an opportunity for government policy makers to detail requirements in transparency and reporting for sharing economy platforms.

Acknowledgement

The presented work is drawn from the HUMANE project deliverable Final Roadmap of Human-Machine Networks (HUMANE, D4.4). This deliverable will be made public following project review, but may be made available before this on request; please contact the roadmap author.

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