The Post-Industrial Society, Subcultures, and Recommender Systems

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Since the early 1960s, a discourse on the emergence of a post-industrial society has addressed the ways in which the growing importance of information, and innovations in digital communications technology, are changing our society. The coming of the post-industrial society after the World Wars has changed the forms of human interaction, production, consumption, and community forming. Networked communication and informational economy are creating possibilities for arbitrary alliances between individuals beyond locality and class-structures. Yet, in some aspects, the logic behind human activity still remains as it has always been. Consumption does not merely satisfy our basic needs, but functions also as a part of identity formation and a marker of distinction.

The Internet age is characterized by increasing masses of information that are managed through various technologies. Along hypertext linking, search engines and community-oriented interaction tools, one of the most essential technologies for managing consumption are recommender systems. Recommender systems automatically recommend items, such as movies, films, or news articles, to users, based on their perceived tastes and interests, as well as the tastes and interests of their fellow users. Besides helping us in discovering interesting new information, recommender systems may deeply affect our ways of living, by making us more aware of the various subcultures and lifestyles that surround us, globally. As information becomes detached from its original context, the social, cultural, and economic issues concerning the production, consumption, and different practices of sharing it, are bound to change as well.

Key words and terms: post-industrial society, sociology, reciprocity, cultural capital, subcultures, recommender systems, collaborative filtering

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1. Introduction

1.1. General Background

In recent years we have seen an explosion in interactive internet services that allow users to submit and review content, as well as engage in a variety of social and communal activities. Efficient information management tools have been integral in creating order and meaning within a society characterized by chaotic streams of data. Tools for retrieving, filtering, sharing, and recommending information are a necessity for controlling a world which has exceeded our cognitive resources in complexity.

Developments in information technology have been essential in creating so-called post-industrial societies, based on information and services, instead of material production. The early industrial world was characterized by an oligopolistic economy, controlled by owners of scarce material resources. Developments in technology enabled efficient production, but required standardization and large initial investments in mass production facilities. Cultural consumption was largely based on mass communication, allowing the public transmission of selected messages through media, such as newspapers, radio, and television. The discourse on the post-industrial society, started already in the early 1960s, has addressed the ways in which the growing importance of information, and innovations in digital communications technology, have reduced the centrality of large industrial production facilities. Information has challenged the role of physical materials as the most important economic asset. In a networked-based information economy, the marginal cost of production is near-zero. Production and global transmission of information require little investment. While printing a newspaper and delivering it to customers was expensive, starting a web service is almost free.

When the Industrial Revolution in 18th and 19th centuries gathered workers in cities around factories, separating them in different sections by their occupational base, the post-industrial society has enabled a shift from static class relations into voluntary associations around spaces occupied by individuals with shared interests. For social scientists, as well as for developers of new technology, it is extremely important to have an understanding of how we have come to this phase in history, what could await us in the future, and why should we bother to view consider societal phenomena when issuing technological questions.

One of the central applications in the post-industrial society are recommender systems. Recommender systems are an array of technologies, designed to present potentially useful information to the user. Usages of recommender systems vary from personal and professional interest to e-commerce and marketing tools. They are used by

entertainment services to suggest books, music or movies that match the individual tastes of users, news sites to generate clicks by offering personalized news, and scientists for spreading interesting documents.

1.2. Aims and Research Question

Even if developers of computer systems often consider usability, business logic, or social issues, such as social trust or community building, they are addressed as individual issues, instead of building onto a comprehensive framework. Sociology and other social sciences, on the other hand, rarely study computer systems in technical detail. The purpose of this thesis is to provide a sociological overview of the historical development of the so-called post-industrial society we live in, and the theoretical concepts used by scholars that have tried to provide explanations for the radical societal changes. As such, it is agenda-setting and theory-building, even explorative in a broad sense. The approach used here focuses on social and economic activity, especially within subcultures, and other taste or interest groups.

Specifically, recommender systems are addressed as a key technology shaping the future of social and cultural activity. However, they are not the sole focus of this thesis, but rather a revealing example and a test-ground for applying social theory into information systems analysis and development. Developers of recommender and other computer systems should address social and cultural questions for two reasons: firstly, to better serve user needs, and secondly, to consider the possible consequences of the choices made in constructing these small social worlds. The research questions that can be postulated for this thesis are: how is network-based social and cultural activity shaping consumption, how could this knowledge improve recommender systems, and what social, cultural, and economic consequences could decisions made by developers of recommender systems have.

1.3. Methods

The method used in this thesis is *economic sociological:* "the sociological perspective applied to economic phenomena", as defined by sociologists Neil J. Smelser and Richard Swedberg [2005]. Classical sociological and economic theories are briefly introduced in their historical context. Besides introducing a variety of theoretical concepts, I will describe the underlying societal and economic issues in a historical, narrative form. While this approach places some burden for a reader familiar with – or disinterested in – the historical changes or the theoretical concepts, it may be helpful for some other readers. By describing societal issues in a narratively, it is also possible to suggest continuities and trends that developers of future information systems might want to consider.

Besides classical theorists of 19th and early 20th century, such as Adam Smith, Karl Marx, Emile Durkheim, and Max Weber, I will consider the thoughts of post-war theorists of the post-industrial, such as Daniel Bell, the economic explanations of culture by Pierre Bourdieu, the Cultural Studies movement started in the University of Birmingham, and various theorists described as postmodernist.

1.4. Thesis Outline

In Chapter 2, I will try to give a brief outline of the emergence of the industrial capitalist society, and the array of societal and cultural changes it introduced. Of special concern, are questions related to economic activity, both in the sense of monetary transactions, and as the social framework that has been the focus of sociologists since the very first academics that originally helped shape the nature of social sciences.

Chapter 3 introduces the discourse on the post-industrial society, a society where the logic of the industrial capitalist society is questioned. The early capitalist world introduced mass communications, some say mass culture, and class-based lifestyles. The post-industrial world, in contrast, is providing opportunities for associations transcending locality and material conditions. Production in the post-industrial society is not dependent of controlling physical resources, but information, cultural understanding, and networking abilities.

In Chapter 3, I will provide an overview of recommendation systems, the underlying technology, and considerations on how they relate to the lifes of their users. Important questions in recommender systems are encouraging user involvement, and predicting user interest and ability.

2. An Introduction to the Industrial Capitalist Society

2.1. Pre-Capitalist Economy

Early occasions of trade were characterised by a sharp distinction between altruistic sharing and egoistic profiting. Before the birth of agriculture and the settling down of wandering tribes, there was little need or possibility for exchange between competing tribes, while members inside a tribe commonly shared their food and possessions as families. As societies grew larger and became more complex, informal exchange relations were born and have since become to form an integral part of our society.

2.1.1. Reciprocal Economy

Economic historian Karl Polanyi [1944] has identified three forms of traditional economies: household, redistributive and reciprocal. A household economy is based on the sharing of food and other goods within families, while a redistributive economy

expands this by including larger social groups, and controlling the distributing of goods by an authority, such as a tribal chief. Reciprocal economies are a more complex concept, brought into discussion by the studies of early 20th century anthropologists Bronisław Malinowski [1922] and Marcel Mauss [1954], who observed the exchange of gifts between tribes in occasions such as the Kula in Papua New Guinea and the potlach among North American Indians. Mauss regarded the gift exchange rituals as a predecessor of formal economies, while acknowledging that similar practices still existed in the western world. The meaning of the gift exchange is engaging in a social relation, instead of simple bartering or warfare. In the rituals, both approaching by giving, and agreeing by receiving and reciprocating are necessary, and motivated by social or religious pressure. Failure to return a reciprocal gift signals the end of the social relationship. The Kula practice was based on an exchange of otherwise unused objects, which brought prestige and social status to their recipients, implying wide social networks. In the potlach, families were gathering together in a celebration, including demonstrations of wealth and prominence by sponsoring the event with various items, many of which were immediately destroyed.

Anthropologist Marshall Sahlins [1972] has further distinguished between three forms of reciprocity: balanced or symmetric reciprocity refers to the gift exchange described by Malinowski and Mauss. A balance in the social relationships is maintained by giving and receiving gifts of equal value. In contrast to balanced reciprocity, generalized reciprocity occurs mainly within families or communities when there is already a high level of trust and a small social distance. No exact or immediate return is expected, but the receiver remains in debt to the giver and is expected to repay it. Tribal hunters typically shared their food, expecting in return that everyone engaged in the process of acquiring it. Similarly, when parents feed their children, the children are usually expected to participate in cleaning the dishes or other household activities. The third form of reciprocity, negative reciprocity, is the least social and most “economic” form with parties of opposed interest trying to maximise their profit, often by cheating or theft. This form of reciprocity is characterised by participants having no mutual trust or kinship.

Sociologist Pierre Bourdieu [1998] followed Mauss and Lévi-Strauss in their observations of gift exchange. Aiming at bridging the gap between Mauss's view of the meaning of the exchange as informal activity maintaining social relations, and Claude Lévi-Strauss's [1969] theory of expecting a counter-gift, Bourdieu turned his attention to the time distance between the transactions. For Bourdieu, the time interval makes the exchange implicit, transforming it into a symbolic form. An immediate return would be considered refusing the gift as a signifier of mutual trust. A gift may also be left unreciprocated by an ungrateful person, or rejected as an insult [Bourdieu 1990]. The

gift-exchange requires, thus, trust in playing the game by the rules. Bourdieu [1998a] argues that the monetary aspects of exchange between family members or friends are often strongly obscured, even sanctioned as taboos. Price tags from gifts are consciously removed, and paying a salary for work performed by a relative sometimes seems inappropriate. Unlike bartered goods, a gift yields a symbolic debt and symbolic capital in the form of prestige, honour and attention.

Besides prestige, the gift-giving practice yields social capital to the participants, exposing them to other individuals, who will then recognize each other as allies or family members that voluntarily help each other. Social contacts are the source of social capital, the aggregate resources the individual can effectively mobilize through social networks or group membership. Generating social capital and benefiting from social relations is not automatic. It may require expenditure of economic capital (time, energy) and competence in understanding social relations and utilizing the right connections. However, the profits that accrue from group membership can be seen as the very basis of group solidarity.

2.1.2. Organized Trade

Sociologist Max Weber [2007] contrasted the lack of economic freedom within hierarchically and religiously organized tribes and clans with the complete economic freedom of external trade, practically a substitute for warfare. While members of the same tribe were expected to share their food and other valuables, those outside the tribe were considered targets for unlimited exploitation. In this sense, the social aspects of inter-tribal exchange can be seen as a clear shift from tribal life, based on family and kinship, to societies, based on loose and complex social ties.

Wandering tribal hunters rarely owned more than they could carry with them. Sahlins [1972] attributed the concept of accumulating wealth to the shift from the mobile Paleolithic hunter and gathering tribes to the more stable neolithic agricultural communities. The development of large, stable societies with a complex division of labour and possessions, contributed to the emerging of internal markets with an increasing variety of products and tribes specializing in trade. The growing influence of trade in society also introduced the need of control and generally accepted exchange values. Outside of a tribal community guided by mutual values and strict social control, trust in the benevolence of other actors needed institutionalisation. An early example are the agoras, the central areas of the city-states of ancient Greek, where political authorities examined the coins and measures used by merchants, and breaches of the market laws were handled by local courts [Swedberg, 2005].

Eventually, professional trade expanded from local cities into larger areas, taking forms such as the European trade fairs in the eleventh century onwards. Trade in longer

distances enabled notably higher profits, but also introduced higher risks, in the form of bandits and malevolent foreign authorities. The European fairs were huge and festive occasions, protected by kings and feudal lords, who in return collected fees from the merchants, for financing warfare. Disputes inside the markets were resolved according to a commonly agreed international law of merchants, Lex Mercatoria, in special market courts elected by the merchants [Swedberg, 2005].

2.1.3. Mercantilism

Foreign trade in Europe started to expand in the 13th century, when Italian merchants, such as Venetian Marco Polo, started to explore and utilize the trade routes established by the invasions and conquests of the Mongol Empire, spanning from Eastern Europe to Asia [Jensen, 1992]. From the late 15th century, the Age of Discovery, started by the Spanish and Portuguese oceanic explorations into Africa, Asia, and the Americas, and followed by France, England and the Netherlands, displayed an impressive economic growth in the colonising countries [Arnold, 2002].

The increased competition for national and colonial resources eventually resulted in explicit competitive restrictions. Trade barriers, such as tolls, licenses, and quotas were beginning to be used by authorities as a means of competition between cities and states. Economist intellectuals, such as Thomas Mun [1664], appealed for maximising the economic assets of the state and remaining a positive balance of trade with other nations, through maximal utilization of domestic natural resources and encouraging the export of high-priced goods. Collectivization and centralization eventually lead to a doctrine that later economists called Mercantilism, subordinating private economic activities to the purposes of the state. Economist Gustav von Schmoller [1897] has argued that it was a determining factor in the emerging of centralized modern national states from unstable municipalities.

The competition between nations was often fierce. Exploitation of the inhabitants and the natural resources of the colonised areas received a clear, divine justification in 1452, with the papal bull Dum Diversas, issued by Pope Nicholas V, allowing the slavery of "Saracens, pagans and any other unbelievers" [Allard, 1912]. Further, a number of wars between the European colonising countries were conducted, following the fierce competition for resources. The series of laws under the Navigation Acts, issued by the English Parliament since 1650, limiting trade with colonies only to English or colonial ships, resulted in two subsequent wars with the Dutch fleet, dominating the world trade [Love, 2006].

2.2. Capitalist Economics

While reciprocal economy was based on abundance, sharing or trading the unnecessary, the Mercantilist doctrine was concerned with the scarcity of natural resources. Mercantilist rulers even systematically used trade restrictions to create situations of artificial scarcity for economic benefit [Ekelund and Tollison, 1981]. As the focus of production shifted from agriculture and handcraft to mass production of goods for international markets, restricting the pursuits of the capitalist bourgeoise became increasingly difficult to justify. The Industrial Revolution and the rise of capitalism gave birth to a new science of political economy, attempting to study the conditions under which production or consumption took place in nation-states. For the first time in history, mass-produced commodities were beginning to be widely available, and the new, rapidly growing and complex economic system raised the question of the advantages and justification of market regulation. In addition to huge amounts of capital for financing factories, the capitalists required a steady demand and predictable behaviour by the state and the legal system.

The birth of international mass markets from the Industrial Revolution in 18th and 19th centuries moved the focus from regulation of trade, agriculture and craftsmanship to innovation and competition in production. Control by governmental authorities and aristocratic landowners was challenged by craftsmen who began to organize as guilds, forming powerful parties for negotiations on the terms of production and trade [Polanyi, 1944]. The shift of focus from traditional to industrial production had a massive economic impact: during 1780-1880 world trade increased by 20 times [Swedberg, 2005]. The Industrial Revolution and the rise of capitalism resulted as well as a reorganization of power and new social problems. Intellectuals and political activists of the time were struggling with understanding the nature of the societal change, engaging in a debate that eventually resulted in the academic doctrine of sociology, the use scientific methods for measuring social activity and finding regularities among complex social phenomena.

2.2.1. Modern Economics and Free Trade

Early political economists were mostly interested in production, especially how prices are formed. Adam Smith [1776] argued that, in an unregulated market, prices would tend towards natural prices: the prices of wages, capital and rent required for production. This tendency was due to the existence of multiple competing merchants in the market, which allowed for the rationally-acting customer, armed with full information concerning the market, to always be able to prefer the cheapest supplier. While competition would keep the prices low for the citizens, there would also be an incentive for the capitalist to increase productivity through technological innovations.

Smith concluded that the interests of a nation would eventually be better promoted by actions based on purely selfish reasons than actions intended for the common good. Based on observations in public markets, he believed that order from the seemingly chaotic market system would eventually rise ”as if guided by an invisible hand”, producing more wealth than any regulated economic system could. In the long run, Mercantilist intervention policy would be harmful for economies.

For Smith [1776], the source of economic growth was the division of labor, exemplified by the industrial making of pins by eighteen distinct operations, which vastly increased productivity compared to individuals single-handedly performing all the tasks. By investing in mastery and development of professional skills, productivity and the quality of work could be enhanced. Ricardo [1817] understood the division of labour as a result of comparative advantages, and thus the source of specialization and trade. By observing international trade, he argued that Portugal had an advantage in making wine. By Portugal producing an excess of wine, the country would eventually benefit from trade with England, where making wine was difficult and expensive but industrially manufacturing cloth was fairly cheap. Thus, Portugal would get cheaper cloth and England would get cheaper wine.

The doctrine of unregulated markets found its counterpart in the utiliarian philosophy of 18th century Italian philosopher and politician Cesare Beccaria, English jurist and philosopher Jeremy Bentham, and English philosopher John Stuart Mill. The origin of utilitarianism can be traced to Beccaria [1995], who proposed rationalising reforms to the legal system, with systematic, clearly prescribed and consistent punishments. Beccaria considered unnecessary punishment to be a crime itself, and argued that equal punishment of unequally harmful crimes will encourage commiting the more greater for greater advantage. The writings of Beccaria strongly influenced Bentham [1948], who declared the principle of utilitarianism as "the greatest good for the greatest number of people". Bentham was a radical advocate of individual and economic freedom, the separation of church and state, freedom of expression the end of slavery, decriminalization of homosexuality, women's rights, and free trade. A son of Bentham's associate, Mill continued the utilitarian movement and engaged in liberalist politics. For Mill [1859], restricting the power of authorities was not enough. Even democratic societies were threatened by a tyranny of the majority. Mill thus concluded, that power is rightfully exercised over people only to prevent harm to others.

2.2.2. Surplus Value

Smith [1776] defined the real price of a commodity as simply "the toil and trouble of acquiring it", but emphasized the distinction between use value and exchange value in an economic system. The use value of a commodity is its utility to the consumer, while

exchange value describes the relative value it has to other commodities in the market, or the amount of labour it can command. Often, use value and exchange value contrast each other: while water is absolutely necessary for everyone, it has an exchange value of a tiny proportion of that of diamonds, which, in contrast, have little use value. Thomas Malthus [1983] resolved this paradox by suggesting that some commodities obtain their value from their scarcity, rather than the actual cost of production. While water is relatively easy to find, diamonds are extremely scarce. Moreover, a shortage of the supply for food would eventually raise its price considerably. Malthus was especially concerned with the fast population growth which seemed to be unmatchable by food production. Giving money to the starving poor could not increase production, but merely increase the prices. Increased production, on the other hand, would lead to further population growth, re-establishing the gap. For landlords, the scarcity of land presented an opportunity to generate surplus value by adjusting rent levels according to market prices.

It is necessary to distinguish between the cost of labor as the living costs (food, accommodation) of workers, and the possible compensation given to them. While Smith failed to construct a complete labor theory of value, Ricardo [1815] continued to suggest that as wages and productivity were not constant among all sectors, the theory should look at the cost of supporting the labor instead. The workers needed food and accommodation for their families and various tools for their work tasks, which all needed more labor to produce, adding up to the value of the commodity. In controlled production, workers will typically receive less compensation for their work than they produce. After the owner of a factory has used his property to command labor to produce commodities, he attempts to sell the commodities for a higher price than the cost of production, generating surplus value to accumulate maximal capital. Consequently, a conflict of interests exists between the consumer, the capitalist, the landowner, and the worker, as each one attempts to maximise their profit. Surplus value is the driving incentive behind the growth in production and the source for the accumulation of capital in the market economy.

2.2.3. Marginal Utility

The simplistic approach of classical economics to pricing was criticized by several proponents of a school of economists called marginalists. Inspired by utilitarian philosophy and the opportunity cost theory developed by Mill [1848], their marginal utility theory suggested that the guiding principle behind supply and demand is the utility of producing and purchasing more goods. While the level of production is restricted by the availability of resources and the capacity of the producer, the level of demand is restricted by the customer becoming less interested in buying more once a

satisfactory level has been reached. Both sides will have to consider whether the utility of taking an action, increasing the level of production or consumption, is greater than the opportunity cost of it. Marginalist economists were devided into two schools, with the neo-classical school concentrating on refining the mathematical models of the classical economists, and the Austrian school founded by Carl Menger, arguing that the foundations of the models, such as the expectance of perfect information and market balance, were unrealistic. For Menger [1950], the time between production and purchase presented an uncertainty and a discontinuity strong enough to totally change the market conditions. The capitalist invests with no knowledge of future returns, ending up in a situation comparable to the how a gift giver gives, risking reciprocation. Thus, the guiding principle behind supply was to be the marginal utility of acquiring the resources to produce, just like the guiding principle behind demand was the marginal utility of acquiring the produced commodity, with the phases bearing no resemblance to each other.

2.3. Social Consequences of the Capitalist Economy

The Industrial Revolution changed the modes of production and the power relations between aristocratic rulers and the bourgeoisie. Urbanization created waves of migration into cities. The radical social changes occupied the minds of a number of intellectuals of late 19th and early 20th century. The doctrine of sociology was starting to establish itself in the academia, through the contributions of Karl Marx, Germans Ferdinand Tönnies, Georg Simmel, and Max Weber, French Emile Durkheim and Gabriel Tarde, and Norwegian-American Thorstein Veblen. Often, academics were concerned about the observable negative effects of capitalism: extreme poverty, crime, and urban social problems.

2.3.1. Alienation and Exploitation

While Smith [1776] recognized the value of mass production and division of labor as a source of welfare, he warned that dividing work into simple, repetitive task also introduces the risk of “mental mutilation” in workers: they may become ignorant and insular, directing their attention only to the simple duties performed. Smith concluded that government attention and education was necessary to prevent this moral degradation on noble citizens. Furthermore, education could be regerded as an investment in human capital. German socialist philosophers Karl Marx and Friedrich Engels [1999] noted Smith's [1776] attention towards the dullness resulting form the division of labour, but argued that mere education was not the answer. Marx [1999] argued that the capitalist will always have an interest to attempt to lower the wages and decrease the number of workers employed, maximizing the surplus value he keeps for

himself. He feels no pity for the workers, as social relationships in the capitalist society are obscured and reduced to seemingly objective relationships between commodities. Like the inanimate, magical objects of primitive peoples, commodities in capitalist societies become fetishes that gain magical power through their exchange value. Reduced to an anonymous commodity, the worker no longer has any control of his work, and is risking to become fully alienated from his work, fellow-workers and everyday life. Since work was the central activity of people, it should not be externally motivated and controlled, but rise from the wants and needs of individuals. Separate slums were already forming in big cities, occupied by exploited, starving workers and unemployed people resorting to crime and prostitution [Engels, 1892].

In 1948, Engels and Marx were commissioned by the international Communist League, started by exile Germans in Paris 1836, to produce a manifesto, laying out the purposes and program of the League. The Manifesto [Marx and Engels, 2006] portrayed the capitalist society, based on market economy, as a distinct phase in the evolution from earlier slave-labour and feudal societies towards a higher, final phase. While the rationalized, industrial society was able to outperform earlier societies in production and wealth generation, it was still unjust in its nature. The accumulation of capital and technological advancements were leading to a situation where a small capitalist ruling class would control all production facilities, while a large working class would be left at their mercy, unable to compete with the highly efficient modern factories as private producers. While some would actually benefit from the fruits of the modern industrial society, the risks would be placed upon the poor. The pursuit for capital, Marx and Engels [2006] believed, would eventually lead to the exploitation of the working class on such a level that they would turn against the capitalists and take command of the tools of productions themselves.

2.3.2. Organic and Mechanic Societies

Tönnies [2001] viewed the rise of the new society as a shift from traditional, organic communities (Gemeinschaft) into artificial and mechanical societies (Gesellschaft). The former were characterized by strong feelings of togetherness and solidarity arising from common heritage, habitation, occupation, or religion, while the latter, referring to the public sphere, described merely practical association for selfish reasons, such as business co-operation. While traditional communities were based on shared world views and loyalty, modern societies were bound to induce conflicts and social problems, and needed strong regulation.

Durkheim [1968] had a more positive view than Marx and Tönnies on the emerging of complex, specialized societies, but warned that anomie, the rapid disappearence of traditional social norms and regulation, could result in anxiety, and possibly deviant or

pathological behavior. He contrasted Tönnies by switching the organic-mechanical dichotomy vice versa. While traditional, mechanical societies were bound by rigid solidarity resulting from shared beliefs, practices and kinship, modern industrial societies, in contrast, were based on the increasing specialization in work and lifestyles. For Durkheim, the regulating principle in modern societies is non-forced solidarity rising from the complex but ”organic” interdependence of individuals. The transition from mechanical to organic societies was beneficial, but not without problems, and Durkheim advocated for common education for preventing anomie. Durkheim was a conservative functionalist, believing that social stratification was natural and essential for the functioning of society. Diversions from normality were merely temporary dysfunctions of the collective consciousness of society.

2.3.3. Innovation and Imitation

Tarde engaged in an explicit debate with Durkheim, arguing that constructing macro-level theories about “social facts”, that could function independently from individual actions, like Durkheim suggested, was taking sociology to an unwanted direction [Clark 1969]. Tarde [1903] saw innovation and social imitation as the explanation for all phenomena. Individuals in close contact will eventually imitate each other , and with the invention and spread of new ideas, old customs are either reinforced or replaced. The success of an innovation depends on the extent of the spread of the desire for it. Typically, the imitation would spread top-down, from the old to the young, and from the rich to the poor. Even the adaptation to an innovation was itself an innovation. Rather than building “mystical” theories, sociologists should just proceed according to a guiding idea. Tarde also adapted his theory to critique the Italian school of criminology (Lombroso, Ferri), that was ignoring the social reasons behind crime, attributing it mostly to biological and geographical reasons. He concluded that, like infectious epidemics spread with air or wind, “epidemics of deviance” spread with the carriers of communication.

Veblen [1998] strongly criticized classical economics. For Veblen, the driving force behind economic life was not the rational individual maximising profit, but irrational practices dating from pre-historic times. Combining observations of contemporary American society with anthropological studies, he traces the origin of social classes to the distinction of superior, able-bodied men, participating in war and hunting, from the labouring women. The “honourable” men contributed relatively little to the community compared to those engaging in direct production, but gained notably more respect by monopolising religion and violence. Similarly, Veblen described the upper-class section of society as an exploiting leisure class, which controlled most of the resources, but spent more time in leisure activities than work. Economic activities of the leisure class

were directed in consuming luxuries and comforts of life. Intellectual efforts of the leisure class were focused in philosophy and the fine arts, which had no economic value in themselves. Veblen saw the “conspicuous” leisure and consumption, wasting time and money, of the upper class as an ancient means of representing social status. Lower-class individuals were “emulating” the tastes and fashions of the rich, hoping to gain status.

Simmel focused in analysing forms of interaction through formal concepts, whether they were in the field of politics, economics, religion, or any other human activity. Simmel [1990] viewed exchange as the purest form of human interaction. All interactions can more-or-less be conceived as having reciprocal effects. Even a completely isolated individual performs as if in relations of exchange, by estimating the sacrifice and opportunity cost related to action. Simmel does not see an essential difference between exchange and production. Exchange is as productive or creative as production, which he describes as exchange of material with nature.

In a society based on money and division of labor, people are emancipated from their traditional roles into free agents. The capitalist society gives its people the freedom of choice, but also the necessity of choice. The capitalist society introduces the loss of difference among people, when everything becomes exchangeable. Preserving difference is possible only through "masks", such as fashion or style. Simmel [1891, 1903] used Tarde's concept of imitation to analyse fashion. Simmel argued that imitation satisfies the need of not standing alone in one's actions. Waves of fashion are the result of imitation, especially from upper to lower stratum. While lifestyles provide the means for differentiation, fashions lead individuals from differentiation to mere examples.

2.3.4. Rationalisation

For Weber, the essential issue in the development of the capitalist society was rationalism, and a change in the modes of thought and action. Examining the nature of social actions, Weber [1991] has identified four ideal types. Affectual action is the result of uncontrolled emotional reactions and emotional tension rising from unfulfilled aspirations. There is no reflection or rationality behind the action, instead the action itself is its own reason. Traditional action is not completely unalike, but does not rise from merely individual experience. Traditional action is carried out in certain situations, often unconsciously, out of gradually learned habit or cultural custom. We do not question the logic of wearing clothes or relaxing on Sundays, instead we take these as granted, since alternatives rarely occur. An alternative to these two forms of non-reflective action is rationality. Value rationality is a form of rational thought, where action is taken to reach a valued, such as political or religious, goal, but with no

thought of its consequences. Instrumental rationality, in contrast, results in action planned and taken after evaluating the goal in relation to other goals, reflecting the actual means and consequences of the action.

Weber [1968] viewed the birth of the capitalist society as a history of the rationalisation of society, the shift from charismatic and traditional domination of religious or strong leaders and tradition to impersonal bureaucracy, from value rationality to instrumental rationality. Weber [2002] traced the rationalisation of society and the eventual triumph of capitalism in Europe to Protestant, especially Calvinist, ethic, which advocated rational means of economic gain as a mundane sign of being blessed by God. This was the ultimate explanation behind why profit seeking in the international centre of capitalism in the 14th and 15th centuries, Florence, was considered ethically unjustified, at best to be tolerated, and a virtue in the ethical writings of American Calvinist scientist and politician Benjamin Franklin, who Weber saw as the culmination of Protestant ethic.

While Marx saw the modern capitalist world as a conflict of ownership between capitalist and working classes that was to be resolved (by communism), Weber [1968] considered limiting the focus of inquiry to production to be ignorant of the role of political and social power in social stratification. A key employee in a large bureaucratic organization may have an average-level salary but still possess a large amount of political power as a decision maker affecting the lives of millions. Similarly, a person with a status of a distinguished professional will usually have his opinion heard in important public issues.

According to Weber [1946], while social classes are based on the distribution of economic resources, status groups belong to the sphere of the distribution of honor. Status groups are normally communities (Gemeinschaft) of inter-connected individuals. Status involves meaningful social action that is communal, and thus traditional or affectual. Classes are stratified according to production and acquisition of goods, status groups according to the principles of their consumption of goods, as represented in different life-styles. Traditional status groups were competing against the free markets. Political parties, on the other hand, were legal-rational associations, based on merely associative social relationships. There are many ways in which an individual can have potential, beneficial influence on other individuals.

In Weber's time, scientific rationalisation was not only a philosophical question, but was starting to be fully applied to the means of production as well. In France, mining engineer Henri Fayol was in charge of one of the largest iron and steel producing companies, and was developing a general theory of business administration. While Fayol [1949] developed the principles of management, with little attention on details, American mechanical engineer Frederick Taylor was independently developing his

theory of Scientific Management, through careful measuring of time and efficiency of workers in their tasks. Instead of relying on tradition and rules-of-thumb, workers should receive detailed, well-defined instructions, developed through scientific study.

Early mass-produced goods were typically aimed at the rich leisure class, described by Veblen [1998]. As the costs of production decreased, and the overall productivity increased, it became apparent that even larger mass audiences could be addressed as potential customers. In 1908 Ford Motor Company, recently started by engineer Henry Ford, released its Model T, a cheap and efficiently produced car, which Ford announced to be targeted for even the common workers in his factory [Foner, 2006].

2.4. Culture in the Capitalist Society

The industrial mode of production and new communicational tools gathered individuals into rapidly growing cities, and created a new type of mass audience for urban and industrially produced culture. Along with crime and deviance in the slums of large cities, the commercialisation and commodification of culture were a concern of intellectuals. Yet, the democratic and lively city life also attracted individuals from all sections of the society.

2.4.1. Mass Culture

Along mass production came mass communication, newspapers, loudspeakers, radio, television, and various other broadcasting systems. A new culture of the masses was born out of the large, heterogeneous masses of people inside the society. It was nothing new that an innovation in communication came hand-in-hand with a radical societal change. Already ancient Greek philosopher Plato [1995] was concerned about the practise of writing, arguing that it has created a group of people, seemingly knowing many things, but understanding little beyond the empty, silent words in their books. Political scientist Benedict Anderson [1983] has described how the introduction of printing press created imagined communities within language groups, eventually leading to the birth of modern nation-states. Mass communication can create audiences with distinct, shared identities from people that remain unknown to each other.

The new mass, or ”popular”, culture, was criticized by scholars and intellectuals of the first half of the 20th century, often on the grounds of conservative elitism or neo-Marxist ”critical theory”. American-British writer T.S. Eliot [1962] saw the ”democratization” of culture as a threat to the traditional class hierarchy and the high culture maintained by the elite. It was the culture of the elites that was to be the highest achievement of the nation, while mass culture threatened the society with the total abolishment of cultures. Spanish philosopher José Ortega y Gasset [1932] wrote of the rise to power of the "mass-man", contrasting ”noble” and ”common” life, or ”barbarism

and primitivism” and ”culture”. The average mass-man was forcing opinionlessness, average lifestyle and values, instead of great European traditions with great men standing out. German philosopher Oswald Spengler [1991], predicted the decline of the western civilization, as a consequence of the loss of morality and culture, following the use of technology to exploit nature. Traditional rule would eventually be replaced by Caesarism, breaking the dictature of money and its political weapon, democracy .

German marxist scholar of the Frankfurt school of critical theory, Theodor W. Adorno [1990] criticized the commodification of culture. For him, as a specialist in modern art music, popular music was banal, standardized, artificial entertainment. Instead of challenging and provoking the intellect and class consciousness of the working class, popular music alienates and manipulates the audience. Another member of the Frankfurt School, Herbert Marcuse [1964] considered mass culture to be a totalitarian system promoting false needs and values, and forcing people to build their lives upon a restricted array of choices offered by the system. The ideology of consumerism encourages us to work and consume beyond fulfilling our basic needs, without regards for psychological, social or environmental damages. Similar ideas were proposed by Italian marxist philosopher Antonio Gramsci [1971], who explained the delay of the communist revolution by cultural hegemony, where the values of the ruling class were imposed upon people through mass media. Gramsci argued that a marxist revolution would require engaging in a culture war where marxists would seek to gain a dominant voice in mass media, education and other mass institutions.

In contrast to the worries of mass media critics, the influence of mass media or propaganda to people's behaviour is not direct, but adapted through intermediaries. Early mass media researchers Elihu Katz and Paul Lazarsfeld [1955] talked about ”opinion leaders” who interpret the messages through their own values and beliefs, and spread a blended message across followers who have less frequent contact with the media. Katz and Lazarsfeld were conducting a study on the decision-making processes of voters in the US presidential elections. Expecting support for the direct influence of media messages on voter behaviour, they were surprised to find that informal, personal contacts were mentioned far more frequently than radio and newspapers as sources of influence. Furthermore, the data implied that there were people who exerted a disproportionately great influence on the vote intentions of their fellows, while reporting that mass media was a high influence on themselves.

2.4.2. Urban Life

The location on the new capitalist society was the city. Cities were also the sites of the observers of the capitalist societies. Marx and Engels regarded cities as the modern replacement for traditional societies [Engels, 1892]. They argued that population would

eventually be gathered around the centralized capital. However, while the cities were alienating and miserable, they still provided for chances for scientific and political activity, as opposed to the ”idiocy” of rural life [Marx and Engels, 2006].

Simmel [1971] was fascinated by the emerging, in big cities, of a ”play-form of association”, or ”sociability”. The ”impulse to sociability” was bringing people together, even if there was no traditional association between them. Sociability was a mode of interaction based on free association, where issues of status or personality were left aside the conversation. With the exception of extreme highest or lowest in status, individuals could easily engage in enjoyable, light modes of interaction in cafes, parks, and other urban public areas. However, the citizens of metropolitan cities often also developed a blasé attitude towards the numerous attractions of the city, and a distant attitude towards their anonymous fellow citizens. In the big city, nothing was surprising, and money could buy anything.

2.4.3. Deviant Subcultures

The working class subcultures in modern industrial cities caught the attention of a number of social researchers, journalists and novelists. Hebdige [1979] traces the roots of subcultural study to the tradition of urban ethnography in nineteenth century Britain: to the social commentary of Henry Mayhew and Thomas Archer, and to the novels of Charles Dickens and Arthur Morrison, describing crime, prostitution and the lives of the poor in London slums.

Formal urban studies owe much to Charles Booth's [1902] survey of lives and occupations of the working class in different areas of London, conducted to improve the conditions of inhabitants and locate areas of crime for preventional policies. Also Tarde [1912] explored the connections between urbanization and crime. He argued that cities were exporting crime to the rural areas, and attracting "outcasts and scoundrels" from the provinces, who would be "civilized" into professional criminals.

In the US, a number of researchers in the University of Chicago witnessed the enormous evolution of Chicago from a small town of 4,470 inhabitants in 1840 to half-a million inhabitants in 1880, ten to one million years later, and to about 3.5 million in 1930 [Weisburd et al., 2008]. Crime and other urban problem problems exploded. In the 1920s a group of sociologists and criminologists began collecting evidence on juvenile street gangs and other deviant groups, and exploring the geographics of the city.

Influenced by Booth, Simmel, and Tarde, Chicago sociologists Robert E. Park and Ernest Burgess explored the relations of occupations and culture, and the geographical structures and mobility in the city and its neighborhoods [Park et al., 1925]. Park and Purgess were able to divide Chicago into five different zones: the central business zone

was a downtown district with skyscrapers, shoppers, clerks, office workers, and very few inhabitants. The zone in constant transition was an interstitial area, characterised by rapid changes, slum and semi-slum districts, and characterized by vice. The zone of the workingmen's homes was located beyond a factory belt surrounding the central business zone, in walking distance for workers. Further outside are the better residential zone of the educated middle class and the suburban commuters' zone. Each of the zones was characterised by different lifestyles.

Frederic M. Thrasher [1927] conducted a survey on 1313 gangs, concluding that they were initially formed spontaneously, and then integrated through conflict and the resulting disapproval and opposition. Gangs had their own social norms of solidarity and morale, along with tradition and attachment to a local territory. Robert Merton [1938] drew on Emile Durkheim's theory of anomie to explain deviant behaviour. Merton argued that a commonly accepted goal of pursuing wealth with the commonly accepted available means (eg. hard work, education) results in a strain when the individual is restricted from using these means.

The first systematic subcultural theory was introduced by Albert K. Cohen [1955], heavily inspired by Merton. Cohen criticized Merton for not presenting an explanation for how delinquent gangs and ″criminal subcultures″ were born out of individual experiences of anomie. For Cohen the explanation lied in the ways how ability is continuously evaluated in schools and individuals encouraged to compare themselves to each other. The failure to achieve expected (middle class) status leads to frustration and an increased risk of engaging in delinquent activities. A solution to the perceived inferiority is turning upside down the norms of larger society to which they are unable to fit. As frustrated individuals identify with similarly situated peers, subcultures are formed with the alternative norms and values as means of building status.

3. Subcultures and the Post-Industrial Society

3.1. The Post-industrial Society

The discussion on the formation of a transformation towards a new kind of economy and society, initially dubbed the post-industrial society, began in the 1960s. If the industrial world was based on large production facilities and scarce natural resources, the post-industrial society is based around information and networked communication. Industrialization created an urban working class around production facilities and urban communities. The post-industrial era is gathering people around heterogeneous, networked information production units, and a global informational community. The emerging of the post-industrial society can be connected to the fierce economic

competition between nations, and the disappointments with laissez-faire capitalism, that were behind the World Wars. The wars showed the limitless potential of science and engineering, bringing together the best minds of the nation in a common quest. The horrors of war showed that technological advancements, such as the atom bomb, could be an advantage that immediately changes the geopolitical balance. A nations advantage was to concentrate on the development of technology and fostering the management of scientific information and communication.

3.1.1. The Backlash of Capitalism

The rise of capitalism brought radical social changes. Polanyi [1944], a 20th century Hungarian Marxist observing the horrors of the World Wars speaks of a double movement, with society's counter-reaction to the spreading self-regulating market and the separation of economic and political spheres, in 20th century socialism and fascism. Turning natural resources and human action into commodities, and making the market mechanism the sole director of the fate of human beings and their natural environment, were to lead to the demolition of society. Polanyi turned the naturalist claims of liberal economists vice versa, arguing that it was the laissez-faire policies that were planned, while protectionism was simply a spontaneous reaction. When in Adam Smith's peaceful times bartering for goods in village markets seemed fair and natural, Malthus' acceptance of natural poverty and extreme liberalism were destructive.

The outburst of World War I was strongly connected to the increasing competition for colonial resources between the leading industrial countries Britain and France, and Germany. By 1900 the British Empire had extended over five continents and France had control over large areas of Africa. Meanwhile, Germany had only small areas of Africa. The tensions had resulted in the escalation of military expenditure and complex alliances between the superpowers and smaller nations, some of which were struggling for independence from the colonisers.

In Russia, the losses suffered during World War I had weakened the economy. Russia was also notably behind the rest of Europe in industry and farming, with the majority of its citizens being farming peasants, struggling for the ownership of land. The fast industrialisation of the country created movement between cities and rural areas, and caused major tensions. In 1917, a series of revolutions occurred, ending in the Communist Party taking over, under the leadership of Marxist revolutionary Vladimir Lenin.

In Germany, the losses resulted in a republican revolution in 1918, a long economic depression and tensions between the new government, revolutionary communists, and extreme right nationalists yearning back the strong, imperial rule. The Nazi party set out its agenda, with Hitler's book Mein Kampf [Hitler, 1939], describing the struggle of

the productive forces of the Western world between the creative, culture-building Aryan engineers and the Jewish acquisitive bankers. Jewish bankers had a large role in the industrial and economic growth of 19th century Germany. German stock market crash of 1873 and the economic insecurity after WWI raised wide antipathy towards the Jews, whose role in the capitalist economy was often exaggerated by politicians, as well conservatives as socialists [Brustein, 2003].

Even though both the Soviet communists and the German Nazis had strong antipathy against the capitalist society, they admired the efficient, machine-like modes of mass production, created by the capitalist societies [Hughes, 2004]. In Soviet Union, as a result of the totalitarian War Communism, the output of large-scale industry in in 1920 had fallen to 13% of the 1913 level, and foreign trade was yielding only 1% of the 1913 turnover [Davies, 1998]. To combat this, Lenin introduced the New Economic Policy (NEP), which allowed restricted market activity, and succeeded in boosting the economy.

In 1928, Lenin's successor, Josif Stalin, replaced the successful NEP with a refined, centrally controlled economy, including successive five-year plans and investments in heavy industry. In 1929, Stalin invited Henry Ford to help in setting up a model factory for the Soviet automobile industry. Also Hitler was visited numerous times by Ford, who inspired the Hitler-supported Volkswagen, a German version of Model-T Ford. While the Nazis were in many senses returning to a mythical past, sociologist Zygmunt Bauman [1991] has argued that the Holocaust performed by the Nazis was deeply connected with the ideology of modernity: controlling the unfamiliar, taxonomic categorisation of species, procedural rationality, and the division of labor into smaller and smaller tasks.

British economist John Maynard Keynes observed the World Wars and the concequences of both, the laissez-faire liberalism of capitalist countries, and the totalitarianism of Soviet Union and Nazi Germany, seeking an alternative, mixed economy. Capitalism had not resulted only in growth and prosperity, but also in unemployment, inflation, and various social problems created by powerty. Centrally controlled economies, on the other hand, had problems in creating productivity and demand. Keynes [1936] critiqued the classical and marginalist economists by arguing that private sector decisions sometimes lead to inefficient outcomes and fluctuation in the economy. During economic downturns, the decrease in the aggregate demand for goods may fail to support the economy, leading to unemployment. During rapid economic growth, supply may fail to keep up with the increasing demand, resulting in prices inflation. Keynes suggested that governments should react by decreasing the interest rates for capital and stimulating the economy with investments in the

infrastructure during downturns. In periods of growth, increasing demand can be sustained by increasing taxation, which will also provide surplus money for downturns.

Taxation functions also as a stimulator for consumption. Accumulation of wealth decreases the marginal utility of consumption in such a manner, Keynes [1936] believed that a decrease in the income of the rich will result in a reduction of consumption that is smaller than the increase in consumption due to the increase of income of the poor. Keynesian economics gave rise to the model of welfare state, adopted especially by Scandinavian and other European countries.

Keynesian economist Joan Robinson [1933] continued the critique of the classical economists, stating that in contrast to perfect competition, economies are always oligopolistic, controlled by a limited number of actors. Regulated public sector organizations and large companies, born through the accumulation of capital, can use the economics of scale and legislation or other political sources of power to gain a dominant position preventing new entrants from entering the market. As large buyers, they also have monopsonist power, allowing control control over the suppliers. The goal of the governments, thus, should be to encourage competition by breaking monopolies and securing perfect competition.

3.1.2. The Rise of Information Technology

In 1945, the Director of the Office of Scientific Research and Development, Vannevar Bush [1945], who had coordinated the activities of 6000 American scientists in the application of science to warfare, published an article, arguing that, after the war, the American scientists should turn their attention into making the national knowledge stores accessible. Burying their professional competition and uniting for a common cause, scientists had shared greatly and learned much through the collaboration during the war. But the specialization and increase in science had made it impossible to grasp with old technologies and practices, leaving many potentially important findings unnoticed.

Despite the surrender of the Axis states, the threat of war was far from gone: arguments over the post-war organization of Europe were divided between the Soviet Union and the US, resulting in a “Cold War”, as stated by Bernard Baruch, a US financier and presidential advisor, in 1947. In 1950, the two fractions of Korea, divided after the war to be governed by the Soviet Union (North Korea) and the US (South Korea) engaged in a vast hostilities, over disputes of organising the re-unification of the country. The resulting war, still officially unsettled, was supported by both governing countries, as well as the newly born communist People's Republic of China, until an armistice in 1953.

The surprising launch of the Soviet Sputnik satellites in October 1957, created an urgent threat of Soviet war technology in the US. As a reaction, The Science Advisory Committee was upgraded by President Eisenhower to the President's Science Advisory Committee (PSAC) in November 1957, and moved to the White House, and in 1958 the Advanced Research Projects Agency (ARPA) was started, to prevent technological surprise like the launch of Sputnik, as well as create technological surprise for the enemies of the US.

The cries of Bush [1945] for making the “knowledge stores” accessible, were soon answered by scientists. The work of mathematician Norbert Wiener in automatic warfare technology during the war, resulted in a series of innovations in communications systems, and in 1947 in a theory of cybernetics [Wiener, 1948]. In 1948, mathematician Claude Shannon, who had familiarized himself with Wiener's work during the war, introduced his mathematical theory of communication [Shannon, 1948]. Both theories were immediately adopted, and gave rise to a new science of digital communications.

Computer scientists and librarians contributed vastly to the emerging discipline of information retrieval, defined by Calvin Mooers in 1948 [Mooers, 1951]. In 1952, librarian Mortimer Taube founded the first information science company, Documentation, Inc. Taube and his colleagues started working on indexing and retrieval methods, especially boolean logic and index terms, for the huge amount of research documents for WW II, under contract to the United States Armed Services Technical Information Agency [Chu, 2003]. IBM researcher Hans Luhn started working on a search system for chemical compounds in 1947, and soon became the head of IBM department for information retrieval [Smith, 1993].

In Japan, the social and economic aspects of the changing environment were studied in several research programmes from the late 1960s, collectively dubbed Joho Shakai (information society) or Johoka Shakai (informationised society). The growing amount of available information and the rise of the information economy raised interest above all to the consumption of information and information flows. Governmental policies were adopted to develop information and telecommunications technology. [Duff, 2000].

In USA, digital communication within the military had increased in the 1950s, with the introduction of the modem, which allowed computers to connect over telephone lines. In 1962, the modem became available commercially. A digital network environment was launched under the name of ARPANET (Advanced Research Projects Agency Network) in 1969 for research and military purposes. The architecture of the network was designed to survive military attacks by utilizing independent, packet switching nodes of computers that required no central control.

During the 1970s, several public computer network services were introduced The Bulletin Board Systems, (BBS) allowed the users to connect to a central system using a modem, and read news and bulletins, as well as exchange messages and files with other users. Usenet was introduced in 1980, adding software for threaded discussion lists which were hierarchically organized by time and topic, and copied across connected news servers. Before the introduction of commercial internet service providers in the late 1980s, most of the modem users connected to a local area system, since distant connections required expensive long-distance telephone calls. In 1983 a universal networking protocol, TCP/IP, supporting communication between different network architectures was launched for ARPANET, introducing the Internet, where various scientific organizations could connect into. The Internet Architecture Board started to promote TCP/IP for commercial purposes, and implementations were quickly emerging for existing services, such as the Usenet and BBS.

In 1991, CERN scientist Tim Berners-Lee introduced publicly the World Wide Web, which was a hypertext implementation to be run over the Internet and connected to by a text-based web browser. In 1993, the first graphical browser Mosaic by Marc Andreessen and his team at the National Center For Supercomputing Applications (NCSA), was made available for free, funded by the The High Performance Computing and Communication Act of 1991. Andreessen went quickly on commercialize the browser and released a new browser, Netscape Navigator in 1994 under Netscape Communications Corporation. Commercial use of the Internet was limited until May 1995 when the National Science Foundation ended its sponsorship of the Internet backbone, and all traffic relied on commercial networks. Microsoft soon reacted by releasing its browser Internet Explorer. In 1998, Netscape founded the Mozilla project for open source development of the browser. [Howe, 2009].

3.1.3. The Post-Industrial Society

Societal and technical history is often described by the metaphor of revolutions, such as the Industrial Revolution. The Industrial Revolution is typically divided into two separate waves, with the first revolution being based on the introduction of coal, iron and steam technologies, and continued by the second revolution in 1860-1900 starting with innovations around steel, electricity and chemicals, and fulfilled with public infrastructures of energy supply grids, streets and railway lines. British polymath crystallographer J. D. Bernal [1939] suggested in 1939 that a "scientific and technical revolution" had begun, where science was beginning to be a new productive and societal force. Being a supporter of Marxism, Bernal concluded that science in the development of society could only be fully utilized under socialism.

Sociologist Daniel Bell [1973] adopted the idea of a revolutionary shift, noting that the western society was in the midst of a vast historical change, where old, property-bound social relations, centred power relations and restrained bourgeois culture were transformed by scientific and technological sources. In contrast to Bernal, Bell argued that the trend was not towards a socialist, but a service-based economy. In the post-industrial societies, services were replacing manufacturing as the driving force for economic activity. This was increasing the meaning of theoretical knowledge, and making institutions of knowledge, such as universities and research institutes the centres of power, similarly to the head offices of major corporations in the industrial society. For Bell, the post-industrial society was a knowledge society, characterized by the increasing meaning of knowledge and learning in economic competitiveness. The essential driving force behind the change was technical advancements in processing and transmitting information [Bell, 1982].

Father of modern management science, Peter Drucker [1959] coined the term knowledge work, describing the intellectual planning and management duties that were becoming increasingly common in the post-modern world. Drucker [1969] argued that the western world was in transformation towards a knowledge society, where new technologies would replace old ones, and the role of knowledge was likely to become the most significant factor creating competitiveness. In the economic life, border-crossing globalization would challenge the role of nation-states and lead to a decline in public regulation and an increase in privatization. Drucker [1976] wanted to revive Taylor's Scientific Management, which had made turned inefficient workers into skilled professionals, and resulted in huge growth in productivity. Careful analysis and planning of work duties was especially important for the knowledge workers.

Sociologist Alain Touraine [1974] was more sceptical towards the new post-industrial society, calling it a programmed society, where a new class of educated technocrats were programming the society through management of major areas of investment, planning, administration, education, research, transportation, cities, housing programmes and even cultural life. In the post-industrial society, technocrats replace an early capitalist class that controlled through ownership and the accumulation of capital in the industrial society. Touraine's theory bears a clear resemblance to Weber's notions on rationalization and bureaucracy. Touraine was critical of the development and hoped that different social movements could resist the technocratic programming by bringing forth alternative meanings and values.

Sociologist Amitai Etzioni [1968] had similar thoughts, suggesting that the advancements in technology and science during World War II had increased the knowledge and capabilities for control in societies so vastly that the values of the industrial age were being challenged. If the rationally organized society of

utilitarianism, capitalism, and secularity, with its origins dating to the 1500s, was considered modern, the new society would be essentially post-modern. Modernity sought to master the physical environment in the service of man, leading to a reduction of man to instrument, and permitting the dominance of the few over the many. As post-modern societies were at risk of doing this to the social environment of man, societies should respond by adopting an active, participative and reflective, orientation, and taking into account the needs of their members.

After more than a decade, the discussion on the economical and societal changes following the advancements in information technology came into focus again in the turn of the 1980s and 1990s, following the emergence on efficient personal computers and the Internet. Economist and Secretary of Labor of the Clinton government, Robert B. Reich [1991], resumed the discussion on knowledge work, describing the rise of the role of "symbolic analysts", such as lawyers, engineers, or scientists, who solve, identify and broker problems by manipulating symbols. They were the core of the American economy, who could not be replaced by machines or foreign workforce. Another class of workers were in-person servers, who may not possess similar educational capital, but can usually not be replaced because due to the need of being locally situated. The third class of workers are routine producers, who are in the continuous risk of being replaced. Reich argued that government should invest in education and empower citizens to occupy leading positions in global competition, while the work of routine producers was likely to be moved into developing countries. Also, the expertise of symbolic analysts should be utilized for societal good.

Sociologist Manuel Castells [*2000*] has criticized the emphasis on the critical role of knowledge and information, seeing it as central in all societies. What is new in the Internet age, is new information technologies. Internet has transformed the information economy from computer-centred to network-diffused. If the centre of the industrial society was the large industrial city, Castells [1989] argues that in the network society it is the "global city" of information networks. The global city is a space of information flows, characterized by synchronicity and real-time interaction without physical proximity. The transformation towards a networked information society can in many ways be compared to the great transformation to the capitalist industrial society. As information processing is at the centre of life, every domain of our eco-social system is transformed. Castells warns that the inequality and misery of the ghettos created by urbanization could be reproduced in the global city.

3.2. Culture and Economy

Following Karl Marx's and Max Weber's analysis of social classes, French sociologist Pierre Bourdieu employed terminology from economics to explain the complex relationships of social stratification. Like Weber, Bourdieu [1986] broadens the concept of capital to account for all forms of power. For Bourdieu, social class is not determined by single or aggregate properties, such as possession of capital, or qualities, such as sex, age, ethnicity or education, but by the structure of relations between them. As the simplistic Marxist class distinction has become ambiguous, the duty of an economic sociologist is thus making the hidden patterns of society visible. In this sense, he was following the social constructivist paradigm of Peter Berger and Thomas Luckmann, and Michael Polanyi's [1951] notions on the tacit dimension of knowledge, stating that societal relations are constructed through everyday practices and practical knowledge [Bourdieu, 2004]. Different views on society evidently included the use of power.

3.2.1. Postmodern Culture

Sociology in the post-war era was strongly tied to functionalism, developed by classic theorists, such as Marx, Durkheim, and Weber, and the Chicago school. Society was seen as a huge, collective system, where each part had an important role, and the task of the sociologist was to locate any disruptions in the functioning of the system, and suggest methods for repairing them. In the field of anthropology, the corresponding paradigm was structuralism, developed by the likes of Mauss's successor Claude Lévi-Strauss. Inspired by structural linguistics started by the semiology of Ferdinand de Saussure [1966], Lévi-Strauss [1963] aimed at constructing a complete framework for the analysis of human activity. While Saussure wanted to explore language as a structured system of signs, Lévi-Strauss was trying to locate similar underlying structures in all forms of human behavior. Lévi-Strauss followed the work of Mauss and Malinowski in analysing the behavior of ”primitive” people, looking for patterns that could be considered universal, such as reciprocal practices. Russian-Estonian semiotician Yuri Lotman [1990] expanded Saussure's distinction of ”parole” (language in use) and ”langue” (language system) by arguing that a similar distinction could be seen in any individual action and the underlying cultural frameworks. If literary texts could be analyzed in relation to the language system, so could any compositions of signs, or ”texts”, in the context of the cultural ”semiosphere” within which the signs were meaningful.

Towards the end of 1960s, the rigid universalism of functionalism and structuralism started to get criticism for not explaining individual social actions or societal change. Sociologist John Heritage [1984] connects this to the waves of social protest and

liberation movements of the 1960s. After colonial wars in Korea and Vietnam, and the disappointment of many socialists in the totalitarianism of Soviet Union, alternative worldviews were welcomed. One of the most influential theoretical challenges was social constructivism, advocated by sociologists Peter L. Berger and Thomas Luckmann. Berger and Luckmann [1966] acknowledge the existence of an objective, physical reality, but argue that our knowledge of it is not objective, like the rationalism of the Enlightenment considered, but constructed through social relations, as Marx suggested. Individuals learn the facts concerning reality through socialization, the encounters with the social interactions and practices of everyday life. In a diverse society, individuals are bound to develop alternative worldviews.

Also many of the structuralists turned against the structuralist doctrine, calling for a post-structural approach, that was embracing a plurality of meanings. Semiotician Roland Barthes [1977] started talking about the ”death of the author”, arguing that instead of the ”original” meaning of the author, literary theorists should concentrate on the plurality and potential of texts. Two persons with different worldviews are likely to interpret the same text differently. Social constructivism and post-structuralism turned the attention of social scientists, literary theorists, and other arts and cultures scholars, towards the meanings and practices of everyday life.

3.2.2. Cultural Capital

Bourdieu [1986] distinguished between four basic forms of capital: economic, symbolic, social, and cultural capital. Symbolic capital is basically an extension of Weber's [1946, 1968] status. It can refer to any form of power that is recognized in some distinct sphere, such as a war hero's prestige, or an elderly person's conceived wisdom. Symbolic violence can be exercised in the forms of racism or sexism, to enforce a preferred social order. Symbolic power can be an aspect of any other form of capital, and it is not perceived as power but legitimized claims for recognition, deference, obedience, or services.

Cultural capital can be defined as the knowledge, education, skills or taste connecting an individual to a status group. Exploring the consequences of formal education, Bourdieu [1993] talks about the “racism of intelligence", used to naturalize social order. Successful, well-educated achievers, who are considered talented individuals, are in fact often those who received the means and mentality needed for successful education through their home backgrounds. Children of privileged backgrounds have already learned to fit teachers' expectations, and can gain respect and social trust through the clever user of cultural commodities. The “natural” ability of “intelligent” children is actually what Bourdieu [ibid.] calls accumulated cultural capital. He considers education to be the most important factor is the transfer of cultural

capital. Cultural capital can also aid in accumulating social capital, providing access to group memberships and expanding the social networks whose resources an individual can utilize in one way or another. The existence of a market of cultural capital leads to both preferring certain cultural phenomena, and listening to the opinions of those wealthy in (cultural) capital.

Bourdieu [1986] distinguishes between three types of cultural capital: *embodied cultural capital* are the naturalized cultural dispositions, habitus, acquired by an individual, either consciously or unconsciously through socialization, education or other social activities. Often this converts into social capital, as a source of correct or respectable behavior. *Objectified cultural capital* consists of the objects, such as art, that have a specific symbolic value. Consuming these objects requires the person to possess the embodied capital to recognize this value. *Institutionalized cultural capital* consists of institutional recognition, such as academic degrees. It supports the conversion of cultural capital into economic capital, especially in the labor market. Bourdieu argues that the existence of a market of cultural capital leads to both preferring certain cultural phenomena, and listening to the opinions of those wealthy in (cultural) capital.

Bourdieu [1998b] uses the concept of *field* to describe the multiple, overlapping spaces of social positions where agents compete for capital. He argues that fields, such as the field of politics, the field of philosophy, or the field of religion, can be analysed independently of the characteristics of their occupants. While fields have their own logic, often incomprehensible to the outsider, there are also general, universal laws concerning fields. Bourdieu adopted the concept of field from Maurice Merleau-Ponty's [1963] analysis of the footballer's practical knowledge of the football field. Rather than open for arbitrary action and choices, the football field is pervaded with lines of force ("touch lines", "penalty area") and articulated in sectors ("openings" between the adversaries), which call for certain kinds of action. The player is not calculating the consequences of actions, but rather feels the direction of the "goal". Furthermore, each manoeuvre undertaken by the player will modify the characteristics of the field and re-establish the lines of force.

As fields are the sites of competition, in every field there is an ongoing struggle between the challengers and the established dominant actors, where newcomers try to break through the entry barrier while the dominant agents try to defend their monopoly and keep out competition. In order for a field to function, there have to be specific stakes and people prepared to play the game. The game itself must not be questioned, but instead its value is constantly reproduced by those players with the knowledge and recognition of the stakes and the immanent laws of the field. However, contrary to utilitarian and most economic theorists, the pursuits for capital are not based on pure

theoretical reason. Instead of continuously calculating the costs and benefits of action, humans follow a practical logic, basing their actions on subtle and tacit strategies and interests that arise from habitus, the meeting of the self-interested individual with the practices of everyday life [Bourdieu, 1998b].

Capital needs reciprocity, maintaining a system of exchange. Like money can lose its value when an economic system collapses, social and cultural capital may lose their value when the cultural competence or social worth of an individual is questioned. To survive, individuals need to acquire capital and spend it in exchange of food and other necessities. In the social world, individuals often need to invest in accumulating social and cultural capital, in order not to lose the social position they have acquired. If a friend no longer keeps in contact, it is likely that the benefits of the friendship are lost. It will no longer produce any value. Similarly, if an expert stops learning, it is likely that the expertise will be questioned when new information in the field replaces older conventions.

3.2.3. Taste and Capital

Cultural capital and the habitus that results from the process of gaining it, form the basis of taste preferences. Bourdieu [1984] conducted a series of empirical studies during 1963-1968 observing the connection of consumption patterns, such as the preference for certain kind of food or entertainment, to the socioeconomic status of individuals. Bourdieu argues that tastes, as manifested preferences are a practical affirmation of inevitable social differences. Tastes are born from social positions and spaces, and unite people with similar backgrounds, separating them at the same time from others. Cultural consuming habits are not only learned from social reference groups. They are also actively used as social markers of certain socioeconomic or cultural positions, to distinguish between groups of people (especially high-brow vs. low-brow). Bourdieu sees the role of tastes being enormous, as tastes are the only thing we can use to classify people, and the only thing people use to classify us.

Bourdieu [1993] sees that the concept of taste can not be separated from that of distaste: judgments of taste are to a great extent negative, and justifications of taste are based on refusal and disgust of other tastes. Aversion to different lifestyles is one of the strongest barriers between social classes. Above all, what is reluctant to those who have acquired a certain disposition to, in Immanuel Kant's [1987] words, ”differentiate” and ”appreciate”, is the mixing of genres or the confusion of domains.

Tastes are the product of an encounter between goods and a taste, supply and demand [Bourdieu, 1993]. They are not static, but depend on the economic situation within the field. All goods tend to lose some of their relative scarcity and their distinctive value as the number of customers both inclined and able to appropriate them

grows. The rarity of the good is connected to the rarity of the customer: ”distinguished” works fall into ”vulgarity” through popularization.

3.3. Postmodern Subcultures

In the early 1970s a school of researchers organized around the Centre for Contemporary Cultural Studies at the University of Birmingham (CCCS) emerged as the most influential source of cultural theory, especially the study of subcultures. The concept of subculture in academic study was broadened from its former criminological meaning to include cultural groups by ordinary people as well. The Cultural Studies movement set out to examine the relationship between culture and society, and raised everyday life as its object of study.

Culture as the object of academic study can be understood in two different ways: as ”high-brow” art and the ”best achievements”, or, in a broader anthropological sense, as a whole way of life and the worldview of a community. Early CCCS arts and literature researchers, such as Raymond Williams, became interested in working-class lifestyles. The tradition of ”high-brow” culture suggested that reading cultural texts requires competence, the ability to correctly interpret the cultural meanings. Thus, cultural studies called for applying literary theory to ”non-respectable” texts as well [Hebdige, 1979]. Earlier leftist cultural critics, especially those attributed to the Frankfurt School of critical theory, were enraged by the mechanistic, unintellectual propaganda of mass-produced entertainment, imposed upon the majority of people. However, the influential theory of encoding and decoding presented by CCCS director Stuart Hall [1973] suggested that instead of accepting the dominant reading preferred by the creator of the text, the audience can challenge the hegemony of cultural texts by completeley or partially opposite readings. Hall wanted to turn his attention to how mass communication was received and interpreted by audiences. CCCS researchers set out to analyze subcultural texts, locating class conflict in the representation of style, especially in the four basic dimensions or modes identified by Phil Cohen [1972]: music, dress, ritual and argot (slang/jargon).

3.3.1. Culture as Resistance

The researchers in CCCS acknowledged the variety in degrees of coherence and separation of subcultures from their parent cultures, but most of the research concentrated on stylistically and habitually distinct groups of working-class boys in different areas of London, such as the punks, teds or mods. The interests of the Birmingham school lied not so much in youth itself, or a theory transcending time and place, but instead they had a clear societal, occasionally political motive to describe the cultural change within British working-class, by observing small fragments that were

considered to be representative of larger structures. Inspired by theorists in the socialist New Left Movement, such as Raymond Williams and E.P. Thompson, the researchers emphasized the role of subcultures as locations for the symbolic struggle between classes and generations. CCCS researchers argued that the most fundamental group divisions and the corresponding cultures in modern societies are based on age and social classes. Groups existing within the same society and sharing some of the same material and historical conditions undoubtedly understand, and to a certain extent share, each others cultures. But just as different social classes are unequally ranked in terms of their wealth and power, so do cultures stand in opposition to one another, being differently ranked in relations of domination and subordination. The definitions of the world and the maps of meaning of those groups which hold the monopoly of power in society, command the greatest weight and influence. Age and class as the basis of societal inequality were soon followed by sex, race and ethnicity. [Clarke et al., 1986].

Hebdige [1979] saw subcultural signs as breaking everyday norms and bringing forth alternative meanings. They stand in opposition to the naturalized, non-historic worldview of the dominant culture and its prevailing myths. To explain the logic of stylistic self-representation, Hebdige adopted the concept of *bricolage* from Lévi-Strauss [1966], who had described how primitive people make improvised, yet coherent, meaning out of whatever objects are at hand. While the elements of primitive myth-bricolage are mainly natural objects, the elements of subcultural bricolage are commodities, objects originally created for other markets, such as the safety pin adopted by the punks [Clarke, 1986]. In the age of mass production, members of the working class subcultures do not possess the resources needed for production, but instead use existing artifacts to create a homological, yet alternative, reality, by re-negotiating the original meanings given by the ruling class. The class conflict takes its form in a symbolic level, through what Umberto Eco [1987] has described as *semiotic guerilla warfare*. Subcultures can take everyday artefacts such as national flags, safety pins, or business suits as their own, and appropriate their original meanings to fit the subcultural frameworks. The objects can even be fetishized, following the Marxian concept, and stripped completely from their original context, becoming valuable as signifiers of the subculture itself.

Gary Clarke [1990] considered the CCCS focus on authentic male subcultures to be ignorant of the variety in subcultural participation and identification. Even when most ”straight” working-class youths deemed outside of subcultures enjoyed the same music, styles, and activities as the subcultures, the researchers in CCCS felt a strong distaste for them. The same Frankfurtian contempt for mass-culture was evident in the disdain for such cults as glam, disco, and the ted revival, which lacked ”authenticity”. When subcultural activities were adopted by those outside the original authentic members of

a subculture, the ”secret” stylistic codes were rendered meaningless, watered down, and the subcultures brought back into line.

Clarke [ibid.] also asked why and how did the class experiences of youth crystallize into a distinct subculture. How and why the styles became popular? Who designed the first leopardskin drape suit? How can we explain the different degrees of commitment to a subculture? CCCS researchers viewed subcultures as static and rigid, while, in reality, many move in and out of different subcultures. Subcultural study should put its eye on the processes by which subcultures are sustained, transformed, and interwoven.

Some, like media theorist John Fiske [1990], have argued that it is not only the members of distinct subcultures that actively attach meaning to the commodities they use, but audiences of popular culture in general. What is central to the consumption of popular culture, is creating meanings from texts, by an acquired intertextual competence. As such, before their active usage, individual texts in popular culture are ephemeral and repetitive. They are full of gaps, contradictions and inadequacies, that give space for varying interpretations. But at the same time they are easy to use, being connected to everyday life, the weekly and daily practices of their users. Fiske [1987] calls this delegation of the production of meanings and pleasures *semiotic democracy*.

Cultural historian Michel de Certeau [Certeau, 1984] has provided a model for the semiotic practices of everyday life by adopting the concepts of *strategy* and *tactics* from military context. De Certeau depicts everyday life as a constant, subconscious struggle between the individual and the surrounding institutions. Institutions generally follow a logic of strategy, making enormous longtime investments in the hopes of establishing mass uniformity and gaining or keeping a dominating position inside a field. Individuals have no resources for such investments, so they are likely to lose the game in the long run. The advantage they have against the institutions is the lack of central planning and independence from the need of securing current investments. Individuals are more able react and invest tactically, in an agile manner. Mass-produced goods and dominant environments are frequently modified for alternative, unconventional use, defying the intentions of the producing institution. This will render the influence of the institution weaker, while keeping the action of the individual too unpredictable and unmappable for the institution to change its strategy.

3.3.2. Subcultural Capital

Fiske [1992] has described how fans often create a "shadow cultural economy", by turning semiotic productivity into some form of textual production, circulating among the fan community. This economic system has its own systems of production and distribution. Sociologist Deena Weinstein [2000] has argued that the lack of recognition in mainstream media, compared to the popularity, of heavy metal music contributed to

the emergence of a heavy metal subculture in the early 1980s. Especially young fans of the genre started their own fanzines, college radio shows, and independent record labels, dedicated to contemporary artists and styles that had not reached mainstream attention.

Sociologist Sarah Thornton [1995] sees that subcultural theories have overlooked the inner hierarchies and struggles within popular culture. Understanding the dynamics of popular culture requires thorough inspection of how cultural goods and experiences are obtained and strategically used to accumulate capital. In her ethnographic study of British club cultures, Thornton introduces the concept of subcultural capital. Musicians, DJs, club organizers, clothes designers, music and style journalists and various record industry professionals all make a living from the subcultural capital gained from their hipness. They are also respected for having a role in defining and creating the culture, as a part of the enabling and producing forces. In club cultures, especially Djs acquire a central position for knowing, owning and playing the music. While cultural capital is accumulated through books and paintings, subcultural capital has its equivalent in fashionable haircuts and carefully selected record collections.

Similar arguments have been presented by former rock critic and popular culture sociologist Simon Frith [1996], who criticizes the ”populist” theorists of popular culture for completely denying or reversing the usual high/low cultural hierarchy. As a critic, Frith finds it impossible not to attach value judgments on cultural goods. For him, the essence of popular culture practice is making judgments and assessing differences. What needs challenging is not the concept of cultural superiority itself, but the claim that it is the exclusive property of the ”high”. Although popular culture is often defined as a form of culture where making aesthetic judgements requires no authorization, there are people whose superior knowledge, experience, and commitment give their judgements a particular weight. The use of accumulated knowledge and discriminatory skill attached by Bourdieu to the ”high”, is apparent also in the ”low” cultural forms and has the same hierarchical effect. In addition to exclusive, elitist club cultures, even fans of the most inclusive mass produced soap operas follow the logic of popular cultural capital, and claim to have a richer experience than ”ordinary”, ”passive” consumers. Part of the pleasure in popular culture is talking about it. Engaging in popular culture means presenting discriminating value arguments.

Thornton [1995] describes subcultural capital as less class-bound than cultural capital. Class does not correlate in any one-to-one way, but is often obfuscated by subcultural distinctions. Images of classes can even be played with: middle class clubbers sometimes adopt working-class behavioral patterns. Assertion of subcultural distinction presents an escape from the trappings of the parental class, in part a fantasy of classlessness. Thornton describes the subcultural Other as the ”mass youth”,

imprisoned by their social position. Elitist clubbers feel amusement and contempt towards the unsofisticated ”ordinary girls” wearing ”housewife handbags” and the beer-drinking, sexually aroused men, who seem lost in the subcultural arenas. They have no understanding for the cultural codes and conventions, and ruin the value of the event with their presence. While cultural capital is accumulated through ”good” manners, subultural capital is accumulated through being ”in the know”: using, but not over-using, current slang and manners. Subcultural is objectified and embodied: nothing depletes more than the sight of someone trying too hard.

Lawrence Grossberg [1992] argues that fans constantly redefine their identity through ”mattering maps” of the cultural world, that help them to determine what matters to them: where to invest time, money, and self. By making ”affective investments”, fans authorize certain things or practices to speak for themselves, not only as a spokesperson but also as surrogate voices. In the postmodern world, mattering maps no longer correspond to any maps of meaning. There is no grand ideology or purpose behind fandom. However, mattering maps often divide the cultural world into ”Us” and ”Them”. When the ”Us” is perceived as a persecuted or at least unjustly ignored minority, the divisions become much clearer and sharper. Marginal status can be rewritten as socio-cultural superiority, possession of the ”true” map.

In contrast to Bourdiean cultural capital, the role of media is often essential to definition and distribution of subcultural knowledge and capital. Being in or out of fashion correlates with degrees of media coverage, creation and exposure. However, the relation of subcultures to media is two-fold: while media has an essential role in building subcultural styles, their prime adversary is the mass media, threatening to exposure the secrets of the subculture. Artists expanding the scope of their listeners outside the original audience may be accused of ”selling out”, abandoning their original community, which then loses its special right of ownership and sense of community. However, mass publicity can often be endorsed in the form of moral panics, which verify the radical distinction of the underground cultures. [Thornton 1995].

3.3.3. Plurality

Simmel [1990] considered the consequence of money to be the displacement of traditional relations by voluntary associations. While, in Simmel's time, these associations were still very much class-bound, they have since become much more evident. Sociologist Ulrich Beck [1992] has explained this by arguing that increasing education and leisure, as well as mobility and competition in the labor market have further encouraged individualization, loosening local and constructing non-local networks. Beck even goes so far as to consider that in Western countries, we have moved beyond class society, into a plurality of individual lifestyles. As traditional class

structures have dissolved, individuals have started to identify by their cultural taste and life-style, instead of their occupational base Bell [1976]. Sociologist Jean Baudrillard [1991] has described this shift towards affection in cultural signs and commodities by suggesting that the world is no longer driven by power and production, but by fascination and seduction.

Robert N. Bellah sees that communities are turning into ”lifestyle enclaves”, shared patterns of appearance, consumption and leisure activities, different from communities which are characterized by social interdependence, shared history, and shared participation in politics [Bellah et al., 1985]. Lifestyle enclaves present a segmental organization, where individuals can be only partially engaged, and communities are divided into homogeneous interest groups. Sociologist Michel Maffesoli [1995] has coined the term ”urban tribes” to describe loose microgroups of people in metropolitan areas, sharing common patterns of interest and behavior. Urban tribes are temporary groupings, formed around everyday forms of sociation, consumption, and informal friendship networks. These groups have no higher moral purpose or project.

Bell [1976] has reminded of early French social theorist Henri de Saint-Simon's concept of the cultural avant-garde. Saint-Simon [1975] considered that, together with scientists, artists were to serve as a cultural “avant-garde” (vanguard), bringing forth new ideas, and exercising a positive power over society "in a priestly manner". Bell sees that the decreased signification of "shocking" new art, and the tension between it and the rest of society, signify that the avant-garde has won its victory. The society has given up over to innovation and "joyfully" accepted change, institutionalizing avant-garde to constantly produce new ideas. Cultural forms no longer conform to Weber's conceptions of rationality, or Marx's ideas of merely reflecting the economy. Even madness can be embraced. Swedish cultural researcher Johan Fornäs [1995] argues that what is considered ”normal” has become less obvious, and the boundaries between that and the subcultural have faded. As a result, seeking distinction and being ”deviant” has become increasingly more difficult.

The fragmentation of culture is offering a wide array of cultural artefacts and practices for the postmodern bricoleur. Bell [1976] has described how the affluence of the middle class in the America of the 1950s had its counterpart in the "middle-brow" culture. Middle-class magazines dedicated their issues on culture to what was "in" or "out" in contemporary popular culture, instead of discussion on serious works of art. What was in, could vary from being ahead of the crowd in fashion, to embracing "vulgar" modes of mass culture (b-movies, large dance halls), instead of "pretentious" middle class culture. Sociologist Richard A. Peterson has called this a shift towards an “omnivorous” behavior in consumption [Peterson and Kern, 1996]. Studying widely the consumption patterns in America during 1980s to 1990s, he has argued that members of

higher social classes are more likely to embrace several different forms and styles of culture.

Philosopher Jean-François Lyotard [2005] has talked about the “death of the grand narratives”. Legitimation and politics in the Enlightenment were build around metanarratives or grand narratives, total philosophies of history with a perceived common-sense truth and ethical prescriptions. In the postmodern society, knowledge and narratives are fragmented into localized roles, and grand quests have lost their credibility. Instead of a metanarrative, knowledge is legitimated by how well it performs, or allows a person, to perform in a distinct role. To avoid falling into totalitarian rule lacking in ethics, this principle of performativity should be replaced by “paralogy”, fostering the search for anomalies and paradoxes in theories and narratives. A heterogeneous plurality of opinions would leave space for unorthodox ideas to spawn.

3.3.4. Scenes

Sociologist Henri Lefebvre [1991] has argued, that every society must produce its own space. Soviet urban planners failed in this, reproducing the modernist model of urban design. Space is a tool of thought and action, providing the means of production and power. The structure and power relations of the city are always connected to those of the society. The traditional city is the focus of social, political and cultural life, but its use value is often being overwhelmed by its exchange value. The natural rights of citizens for their city are sold and replaced by a forced, hegemonic order. Lefebvre [1996] appealed for common, full citizenship, the right of participation and appropriation of public space and culture, without surveillance and police repression. A public space should be left open for heterogeneity, in order for it to remain public.

Communications researcher Will Straw [1991] has suggested that the focus should be shifted from subcultures to ”scenes”, cultural spaces serving as locations for the co-existence and interaction of a variety of practices. The concept of subculture suggests a degree of interaction, shared community, and common sociological variables, that fails to describe the informal and dynamic nature of cultural activity. While styles and subcultures vary over time, the institutionalized locations for their production and consumption prevail. In contrast to the traditional, historical and evolutionary view on popular culture canons, styles are no longer emerging and fading, or born from alliances of cross-fertilization, but are allowed to co-exist independently. An eclectic revival to a historical form can be seen as a norm.

Sara Cohen [2000] uses the concept of scene to describe situations where the boundaries between formal and informal activity, and the roles of audiences, producers and performers have been crossed and obscured. Scenes defy the assumption of

commitment, homogeneity and locality of subcultures or communities, emphasizing, instead, the dynamic, changing and global nature of cultural activity. Local scenes have a distinct nature, local material and structural conditions, and they emerge from the social activity of people. They require constant activity, networks, distinctions, and the spreading of information, rumors, magazines, records, musical instruments and likewise cultural artefacts. With personal connections, information about the scene and its activities is built, along with boundaries, inclusion and exclusion. Media has a strong effect on how scenes are conceived. To an extent, it may even create and restrict them. For example, musical artists are sometimes connected by the media to their local origin and roots, and deemed ”authentic” by the media, as was the case with the ”Seattle sound” and grunge rock boom in the early 1990s. A number of artists even moved to Seattle in hopes of media attention and increased cultural credibility. However, there is strong uniformity in the relations of scenes between cities and countries. As Straw [1991] puts it, cultural goods and producers circulate from one local scene to another with little need of adaptation to local circumstances. Innovations do not so much flow from local scenes to the outside world, but follow particularly stable sets of languages and the relationships between them.

The dynamics between informal scenes and collective subcultures are largely based on issues of authenticity, homogeneity and commitment. An ethnographic study of the punk scene of a southwestern American city by sociologist Kathryn Joan Fox [1987] provides a descriptive example of informal social stratification within scenes. The study was conducted in a local cowboy bar serving as the only local space available for "punk nights". Fox identified a hierarchy of three categories of punks, perceived by their commitment to the scene: "hardcore punks", "softcore punks", and "preppie punks". Another type that was periferal to the scene, was referred to as "spectators". The hardcore punks were the most involved and prestigious members of the scene, setting the trends and standards for the rest of the members. Softcore punks were a larger group, with similar high involvement but lacking the dedication and permanent association to the deviant antiestablishment lifestyle of the hardcore punks. While being highly respected by the less committed participants, they did not occupy the same social status within the group as the fully committed hardcores. The largest portion of the members of the punk community were preppie punks, who were not considered as ”real punks” by the typically older hardcores and softcores. They followed the lead and seeked the attention of the two core groups, but were only minimally committed to the identity. Preppie punks frequently changed their appearance and were sometimes described by other punks as engaging in a costume play. The largest part of the crowd in any punk event were the spectators, who were not actual members of the community and did not try to look like punks. The spectators did not necessarily share the standards

of the community, or revere the actions and dedication of the hardcores, but merely had an interest in the punk scene as consumers. They wanted to observe the fashion, listen to the music, and to be ”in the know” of the scene. They were mostly ignored by punks, unless they appeared to look completely antithetical to punk, generating laughs among some members of the community. Although periferal to the scene, Fox argued that spectators provided an alternative set of norms that functioned to delineate the social boundaries of the community. Furthermore, while the preppies and spectators were not producing or respected members, they were still essential to the scene by providing an audience large enough to support its material needs.

3.4. Information Economy

While the industrial economy was based around material production, and control of natural resources, the information economy is based on knowledge and communication. Classical economists models of the market economy were based on expected perfect information between actors. In reality, information is restricted by organizations, utilizing patents and copyrights, and by individuals concerned about their privacy. However, in recent years, traditional industries have been challenged by practices such as internet piracy, peer production, and social media.

3.4.1. Information Asymmetry

Following Keynes [1936] and Robinson [1933], it is possible to critique the assumptions of the classical economists. Like perfect competition, perfect information in markets is an exception. Instead, information is asymmetrically distributed, and can be used as a tool for controlling the transaction costs of exhange within the market. It is an asset producing comparative advantage. While the marginal cost of producing (copying) information is close to zero, information exchange in current market societies rarely happens freely or with near-zero cost. Instead, companies are utilizing knowledge management programs, designed to maximise their comparative information advantage by fostering knowledge creation and securing information from leaking to competitors.

Besides organizations, also individuals are competing for knowledge assets. Individuals with particular knowledge and interests have a comparative advantage in those fields. Expenditure on training and education can be considered an investment that yields profits in the form of enhanced production. Lengthy education may seem costly and prevent full-time work, but it will eventually pay off with increased future income or more enjoyable working conditions. Accumulating human capital is also not limited merely to education and training, but can take a multitude of forms through internship, migration, and other career building actions. Engaging in the acquisition of

human capital may continue until marginal costs equal marginal returns, e.g. when paying for further education is no more likely to increase future salary expectations [Becker 1964].

As the distribution of information is unbalanced, exchange often occurs in situations of information asymmetry. Economist George Akerlof [Akerlof and Maun 1970] talked about *adverse selection*, where the seller knows more about the product than the buyer. Due to this uncertainty, buyers typically expect a product to be of average quality, refusing to pay above average price. As a result, sellers of above-average quality products may withdraw from the market, regarding average price as insufficient compensation. Two solutions were proposed for this problem, where the information gap is narrowed by either side. Economist Michael Spence [1973] has provided an example in job markets. Job-seeking candidates are expected by companies to have an interest and ability in learning. Companies have no direct ways of measuring this, but job seekers can send a credible *signal* by acquiring certain education credentials. Companies, on the other hand, can *screen* the applicants for their qualifications.

3.4.2. Knowledge as an Asset

Utilizing knowledge and information resources is the key issue of the practice of knowledge management, which emerged in the early 1990s within management theories. Information systems scholars Niall Hayes and Geoff Walsham [2005] divide the academic discussion on knowledge management into two contrasting schools: the content and the relational perspective. The content perspective sees knowledge as a human-independent asset that can be codified, shared, stored and measured. Knowledge, in this sense, is a collection of inter-related truthful assertions, a set of instructions for a given problem situation. This approach sets the focus to the construction of knowledge repositories and the tools maximising the utilization of knowledge assets by enabling the transfer of the right knowledge, to the right person, at the right time. The key questions then become, what knowledge assets does the organization have, and how quickly can it employ these assets if required. An organization must secure its knowledge from leaking to competitors, but at the same time also ensure the free flow of information between relevant parties. The mechanistic, asset view on knowledge also reveals several problems with knowledge sharing. Management scientist Georg von Krogh [2005] rightfully poses the question of why and under which conditions would the members of an organization share their knowledge. Individuals may not be willing to give away their personal assets that can be used as a source of power within the organization. If the knowledge vital to the organization is possessed only by certain individuals, this gives them them advantage in

negotiations on positions, salary, working-conditions, and several other issues. Information-sharing may also require rewarding if it is seen as an unwanted external activity, in addition to the actual work processes that are carried out. Building a community with a sense of mutual interest and common practices for sharing knowledge becomes the key task in accumulating organizational knowledge.

The relational perspective defies the nature of knowledge as an entity to be shared or stored, like data or information. It relies on the constructivist and pragmatist philosophical schools, which see knowledge not as a set of facts, but as an ever-evolving product of human activity. Rather than obtaining single, autonomous facts, we continuously re-build our world view through our encounters with the world, creating expectations and hopes. Knowledge exists only as socially embedded and inseparable from practice; it can not be externalized or shared as such, out of its original context. Hayes and Walsham [2005] describe knowledge repositories as merely "snapshots" of the broad arrays of memories, beliefs and emotions experienced by individuals in different times and spaces. What is important, on the relational perspective, is the process of knowing and the ability to act. This raises the question of trust and commitment within an organization to another level from the mechanistic content perspective. It may not be enough to persuade individuals to share their knowledge assets, if the individuals themselves are the sources of these assets. The knowledge that resulted in a single, recorded decision might just be too complex to be codified, stored and then re-used to solve another problem at a different time and context. However, the tacit knowledge gained by an experienced individual may be enough to generate a solution. This also requires a certain amount of trust to be placed in the individuals and their abilities, if the decision-making processes are based on their judgement rather than hard facts.

3.4.3. Network Economy

In a network society, action depends heavily on participating in networks. Castells [1989] sees that old, locality-based and hierarchical systems are replaced by streams through the nodes of global networks. The capacity of generating knowledge, and utilizing it by processing and managing information, determine the productivity and competitiveness of all economic units, be it countries, companies, or individuals. The network economy introduces the network organization, co-operating by sharing information. While reducing comparative advantage by giving away a part of their information assets, network organizations can acquire reciprocal resources and gain through the economics of scale within networks. Increased information exchange will also make the organization more responsive to its environment. Lean and agile networks adapt to change faster than the bureaucratic systems of the old industries. In

the network economy, companies are being divided into smaller units and work is becoming project-based, with teams assembled through networks on need-basis. Core strategic activities (business, science, technology) can be run globally in real time or chosen time.

Harvard Law School professor and Internet researcher Yochai Benkler [2006] sees that in the industrial economy and industrial information economy, most opportunities to make things that are valuable or important to people, were constrained by requirements for capital. In the networked information economy, the necessary capital is broadly distributed. Establishing a web service is cheap, and in recent years we have seen a number of small start-ups entering the market. In the industrial information economy, limited access to information emphasized the role of intermediaries with special knowledge and information resources. Traditional media industry was characterised by institutions controlling a limited number of relatively expensive channels for broadcasting or ”publishing” selected messages to a receiving audience: newspapers, record deals, book publishers, and film studios. The internet model, in contrast, allows setting up minimal-cost virtual channels for interactively exchanging messages.

In a traditional market, sales are usually concentrated on a small proportion of goods, while the majority remain unknown to the general public. When the sale of goods was based in physical locations, and advertising conducted in traditional mass media, customer awareness and access to products was strongly limited by strategic decision of companies. Chris Anderson [2004], Editor-in-Chief of the technology periodical Wired, has brought into public discussion the *Long Tail effect* in commerce. The term is borrowed from statistics, and used to describe the skewed distribution of goods in the market. The long tail of a market is the long array of potentially relevant, but obscure, goods missed by most of the users. In a network economy, the information gap between producers and consumers can be narrowed, and sales expanded worldwide and beyond the marketing period. As an example, Anderson gives the e-commerce store Amazon and the video rental service Netflix, which both have increased their sales by providing personalized tools for customers to locate interesting items.

In recent years, computer networking has expanded beyond user interaction, towards device interaction. Mobile and location aware devices are bringing computation into totally new areas. Any data, involving or surrounding the user (user actions, geographical, sensory, and audiovisual data), can be used as a feed for context-aware computation. Many talk about ubiquitous, or pervasive, computing, where digital technology has been adopted for use in various portable devices, such as mobile phones, audio players, radio-frequency identification tags, GPS, and interactive

whiteboards. In the near future, all these devices can be connected through the forthcoming, next-generation Internet Protocol IPv6, allowing 2^{128} addresses.

3.4.4. Participative Economy

In recent years we have seen a number of social networking and other services, where individuals are publicly sharing information about themselves, their tastes and interests, and their social connections. Through networks, also producers can engage in direct dialog with customers, and address more specialized groups instead of a heterogeneous mass audience. Collecting customer data or engaging consumers in economic activity is not a radically new idea. Word-of-mouth marketing has been utilized by marketing professionals for decades. But what is new in our age, Benkler [2006] sees, is that consumers not merely spread information and opinions on goods and services inside their social networks, but are actually adding value to commodities by physically transforming them. Amateur media in the web is stretching the boundaries between the private and the public sphere, and producers and consumers. Internet has also broadly introduced what Benkler calls "commons-based peer production", where large numbers of people contribute to large, meaningful projects without the necessity of centralized control or monetary compensation. Well known examples are Wikipedia, Creative Commons, and Open Source Software.

Amateur activity is less individualist and hierarchical, and more playful and collaborative than the activities of centralized professional media firms. Amateur media has also radically increased the diversity of the entertainment content available to consumers. The multitude of opinions has not merely entertainment value, instead Benkler [2006] sees that blogs and participatory production can lead to a more critical and reflective culture. Even if the rapidly changing network society is producing more fragmentation, anomie is prevented by more opportunities for seeking community. Harvard Law School professor Terry Fisher [2006] also points at the Fiskean concept of semiotic democracy, reminding that less alienation is likely to occur when people are engaged in the construction of their cultural environments.

While early mass media critics were concerned about the preservation of high forms of culture in the pressure of low-quality, commodified culture, similar voices have been heard with the emergence of amateur production. British-American entrepreneur and author Andrew Keen [2007] is known for criticizing the participative web phenomenon for destroying professionalism, and making it impossible to find high-quality information. Even if this is a provocative exaggeration, it can be argued that, without proper tools for finding and promoting high quality culture, we are at least not using our cultural resources efficiently. Without tools for screening or signaling the quality of information resources, consumers will tend to expect these resources to be of

average quality. As consumers become reluctant to investing above average capital, high quality producers will be driven off the market. An excess of information may also lead to boredom, and reluctancy towards new information, as in the big cities described by Simmel [1971].

3.4.5. Exchange and Competition in Internet Culture

The early internet cultures displayed playfulness and competition in technical and cultural skill. Typical hobbies were computer games, “cracking” (removing copy protection), “hacking” (breaking into computers), and making demos (programmed audiovisual demonstrations), which all involved competition in accomplishing impressive results with restricted resources. Conversations often involved words or phrases in so-called “leet” (elite) speak, with playful use of misspellings and ASCII characters, as in “1337” (“leet”) or “haxor” (hacker), making it difficult for outsiders to understand. Newcomers, and those failing to understand the language or cultural conventions, were greeted with the word “n00b” (“noob”, newbie), underlining their shameful lack of cultural capital obtained by long-time involvement. Domination in video games or arguments, or the successful hacking of a computer or website, was followed by the celebrating comment “pwn3d” (“owned”).

The near-zero marginal cost of information has introduced a shadow economy of internet piracy, where copyright protected information is illegally distributed within the networks, through peer-to-peer file-sharing programmes and internet communities. In their study on the social organization of IRC-based audio piracy on the Internet, Jon Cooper and Daniel M. Harrison [2001] describe the nominal purpose of the piracy community to be the exchange of high quality MP3 files between people, making them easy to locate, share and store for future usage. The community has a distinct set of norms, and a categorization for exchange behavior. A pirate's online actions may fall under three modes or roles, that of leech, trader or citizen.

Files obtained via the leech approach are received free of charge, and without social obligations. The process often requires minimal social effort and no further interaction within the subculture, and is only triggered by locating available files. Leeches are regarded as the bottom of the social hierarchy and have no means of shifting their position.

A trader's approach is based on a system of exhange value. A trader tries to find another user in possession of a given audio file and negotiate a deal of exchange. If the file is difficult to obtain, the conditions for receiving it may be stringent. Sometimes, the requesting trader may even be asked for a file that he or she does not possess, and will thus be forced to seek out it, in order to make the trade. Ability to fulfill such requests is considered a display of status within the community. The accumulation of

files contributes to their shifting of social location and the ability of social interaction. Traders compete in the ability to share valuable files through fast internet connections, and often publicly display their usage statistics, but may easily become disinterested if they are approached with uniteresting collections.

Citizens see sharing files as a favor to the community, and serve leeches in addition to trading actively. The main difference between citizens and traders is, however, the former's interest in social interaction beyond the required exhange protocol. Citizen users seem to enjoy the gained social status and power as well as the actual exchange of files.

As copying and distribution of digital goods is free, exchange between hobbyists requires little material capital. Unlike companies, amateurs are not restricted to generating economic capital. Instead, their goal may be any other form of capital (social, cultural, symbolic). Peer-to-peer communication or economic activity could be seen as a revival of pre-industrial economic models, where individuals freely interact with negotiated terms, or even a symbolic reciprocal model similar to the Kula exchange and potlach, where economical activity is conducted for negotiating social relations.

4. Recommender Systems

4.1. Recommender systems

The Internet age is providing consumers increasing possibilities for developing their taste and cultural habits, exploring subcultures and lifestyles, and participating in different economies and communities. One of the most essential technologies for managing consumption are recommender systems. Recommender systems are an information filtering technology that actively attempts to present information that is likely to be of interest to the user. Typical applications are e-commerce sites using automated personalized marketing techniques, and services for discovering potentially interesting music, films, books, news or people.

4.1.1. A History of Recommender Systems

In a letter to ACM in 1992, Peter J. Denning [1992], president of the association, called for "information filtering" tools to handle the increasing amount of electronic mail. He considered that too much time was going into skimming and dispatching electronic messages, and the flow was threatening to exceed his "mental bandwith". Denning adviced the research community to study communication paths in existing organizations, and replicate successful communications electronically by abstracting key properties. Suggestions for electronic mail management by Denning, were content

filters, multiple target locations, and importance assessments by sender, with feedback/bias assessments by receiver.

Information scientist Nicholas J. Belkin has described information filtering and information retrieval as ”two sides of the same coin” [Belkin and Croft, 1992]. While information retrieval tasks are mainly concerned with one-off queries for finding a sufficient amount of information to satisfy an information need, information filtering systems provide continuous data streams that are filtered for removing unwanted data. Continuous user needs are typically served by monitoring user involvement with documents, and organizing the data into data structures representing user-specific ”profiles” [Adomavicius and Tuzhilin, 2005].

One of the first information filtering systems was Tapestry [Goldberg et al., 1992], an experimental mail system, developed at the Xerox Palo Alto Research Center in 1992. Like Denning [1992], the researchers were concerned about the growing streams of documents that resulted from the increasing use of electronic mail. The traditional approach for managing document distribution was establishing mailing lists and allowing the users to subscribe to those lists of interest to them. Several mail systems provided the user with additional filtering tools to select documents by textual content. The developers of Tapestry considered the mailing lists and content-based filtering tools to be insufficient in responding to the complex information needs of the users, and believed that the management of document flows could be enhanced by involving other users. The term *collaborative filtering* was introduced to describe how the users would be helping one other perform filtering by providing reactions to messages. These reactions included sending, receiving, or replying to a document and assigning relevance to it. Querying the reaction events was enabled by the Tapestry Query Language (TQL), and individual queries could be stored as periodically executed, continuous filters.

Building on the Tapestry concept of collaborative filtering, a similar filtering system, GroupLens [Konstan et al., 1997], was soon developed for Usenet news in the Department of Computer Science and Engineering at the University of Minnesota. The GroupLens system used ”quick ratings” of 1-5 for evaluating news items easily. The researchers hypothesized that traditional content analysis methods of information retrieval and filtering could not scale as well as collaborative medhods to situations where there are thousands of documents with multiple unique features. Due to the combination of high volume and variance in personal tastes, the researchers speculated that Usenet would have high potential predictive utility. The hypothesis was confirmed by a comparison of the significant amount of desired items inside the recommendation set, compared to the database population. A major finding of a pilot study was that the users strongly disagreed about the ratings. To overcome the problem of calculating

relevance predictions among groups of people, a correlation engine was added to identify potentially like-minded, similarly rating users. Using subsets of voters selected by similarity for generating recommendations showed to clearly outperform methods based on aggregated user average.

In 1994 Ringo, an e-mail based system for music recommendation was introduced by MIT researcher Upendra Shardanand [1994]. Ringo filtered items based upon ratings by other users who were similar to the active user. By registering to the system, the user would get a list of 125 popular and randomly select artists, with the request to rate them on a 1-7 scale, as a basis for profile generation. Interaction with the system was performed by sending requests via e-mail to be processed periodically. The user could submit ratings and reviews, and request for potentially enjoyable or non-enjoyable artists, and predictions for single artists. Along the recommendations, examples of submitted reviews and historical information, gathered by system administrators, was provided. The system was commercialized, changing its name to Firefly in 1995, with a web interface, an online cd store, and movie recommendations. In addition, Firefly also provided targeted advertising and licenced the recommendation technology to other companies. The service was under extensive development, until the company was acquired by Microsoft in 1998 and eventually transformed into Microsoft Passport.

In 1996, the GroupLens technology was commercialized under NetPerceptions, Ltd. One of the first commercial users of the GroupLens recommendation engine was the electronic retailer service Amazon (http://www.amazon.com), launched in 1995 as an online bookstore. Utilizing the GroupLens engine, Amazon introduced features, such as personalized book recommendations, based upon customer ratings, and an ”If You Like This Author” selection which allowed customers to select their favorite authors and see a list of suggested similar authors [Amazon 1997]. As the Amazon database has grown in size, the company has been able to introduce innovations in scalable methods supporting the personalized marketing features.

In 2002, as the result of a computer science project at the University of Southampton School of Electronics and Computer Science, Richard Jones launched the Audioscrobbler (http://www.audioscrobbler.net) system for recording user history by plugins for the popular Winamp and XMMS music players [BBC 2003]. Audioscrobbler enabled generating music recommendations from the user's actual listening habits. The programmable API was released publicly and a number of plugins were generated within the open source community. Jones was soon approached by the internet radiostation and music community site Last.fm (http://www.last.fm), and Audioscrobbler technology was integrated into the site. The features of Last.fm include automated streams as ”personalized radio stations”, recommendations of new music,

journals, events and other people with similar tastes, and interacting with other users by discussing and creating friends lists and interest groups. Artists and songs can be labeled with descriptive tags (keywords). Additional information includes artist information pages, previews for music, links for purchasing items, and popularity charts. The Last.fm Flash radio player can also be embedded into external web pages.

The Music Genome Project was founded in 2000 as an effort to construct a music ”genome” by using over 400 different music attributes (”genes”), from style and genre labels to composition and orchestration details, assigned to music recordings by hired, trained musicians. Tim Westergren, the CEO and founder of the company, was struggling in his work as a film music composer, trying to bridge the gap between his musicological vocabulary and the somewhat vaguely expressed needs of the film directors [John, 2006]. The attributes gathered in the project are used in a commercial service, the Pandora (http://www.pandora.com) music player, which is available for several desktop and mobile platforms. The user can enter seed artists or songs to start the music stream, and then vote for hearing more or less of the type of songs in the stream, until it is satisfactory. Multiple streams can be created for different styles. The Pandora player is currently available in the USA only, because of royalty disagreements.

Currently, recommender technologies form an integral part of the services of the many of the leading Internet services. Social networking service Facebook (http://www.facebook.com) suggests other users the user might want to connected with, as well as event and fan groups joined by the user's friends. Video service Youtube (http://www.youtube.com) displays lists of similar videos, based on currently viewed video, or videos previously viewed by the user. Music player Spotify (http://www.spotify.com) provides suggestions of similar music, based on past and present user activity, and allows sharing of playlists through a web service. Many of the services allowing user commenting, allow users also to rate content or other users' comments, emphasizing highly rated information, and hiding or deleting poorly rated information. Recommender technologies add to the value of information systems in many ways, by increasing use value and generating feedback.

Propriety and open source systems and libraries are available for developers in several programming languages and under most operating systems. Examples are the SUGGEST (http://glaros.dtc.umn.edu/gkhome/suggest/overview) Recommendation Engine , an executable library for Linux, Windows and Sun OS , Cofi (http://www.nongnu.org/cofi), an open-source Java-based collaborative filtering library , and Vogoo (http://www.vogoo-api.com), an open source PHP recommender library, with propriety extensions.

4.1.2. Recommendation Methods

Since the first collaborative filtering systems, most researchers have adopted the term ”recommender system”, emphasizing the active pursuit for recommending items for users. Recommender systems are usually classified into three categories, based on how the recommendations are made [Balabanovic and Shoham 1997, Adomavicius and Tuzhilin 2005]. *Content-based* systems recommend items similar to those a given user has liked in the past, while *collaborative* systems identify users whose tastes are similar to those of the given user. A third category are *hybrid* systems, that use combinations of the two approaches to elaborate their performance.

Content-based systems are trying to understand the commonalities between the items the user has rated highly in the past, and predict the utility of each item for the active user. Typically content-based systems handle textual data, extracted from the documents or included as metadata, but also applications for audio and visual data exist. A typical method is keyword analysis,which can be conducted using traditional information retrieval methods, such as the vector space model. Distinction between important and unimportant words can be controlled by a weighing scheme such as the term frequency–inverse document frequency (tf/idf) [Spärck Jones 1972]. An item profile for the user can be defined as a vector of weights for each keyword.

Content-based recommender systems have several limitations. [Balabanovic and Shoham 1997, Shardanand and Maes 1995, Adomavicius and Tuzhilin 2005]. If the user is rating mainly similar content, the recommendations may become over-specialized, and the user will be restricted to overtly similar items. Also, inserting data to the system is restricted: features of the items must be in computer-readable format or assigned manually, requiring time and effort. If the system is only concerned with the preferences of single users, an extensive list of ratings is typically required for each user to achieve high performance. New users, and users exploring new content areas, suffer from a cold-start problem, where they will have to develop and train profiles from scratch before any recommendation can take place [Maltz and Ehrlich 1995].

Traditional information retrieval methods are technologically limited in their possibilities for analysing documents as cultural items. While several advanced methods for comparing text content exist, extracting information from the content of documents is a highly complex domain. To fully analyze the deep content of a literary work or a multimedia presentation goes well beyond the scope of current technology. Traditional information retrieval methods can identify topics and themes in documents, or estimate their similarity, but cannot easily determine their quality. A low quality article will be recommended as likely as a high quality article if they contain an identical set of keywords.

Introducing a human component can aid in solving the quality problem. Recommended items can be selected by other users, or editors, artists, critics and other domain experts. Instead of recommending items similar to the ones the user has liked in the past, a user-to-user system identifies other similar users, and recommends items they have liked. Similar users can be identified automatically by the system or selected manually. Collaborative systems predict the utility of an item from ratings by other users that are similar to the active user, or share some other distinctive quality. Algorithms for collaborative recommendations can be grouped into two general classes: *memory-based* (or heuristic-based) and *model-based* [Breese et al., 1998]. Memory-based algorithms generate predictions by operating over the entire user database, while model-based algorithms use the user database to estimate or learn a model, which is then used for calculating predictions.

Memory-based algorithms predict the votes of a user from a database of user votes , representing a sample or a population of other users. A sum of votes is calculated by assigning weights reflecting the distance, correlation, or (vector) similarity between each user and the active user. The level of distinctiveness of the items can be adjusted by modifying votes by the inverse user frequency [Breese et al., 1998], an analogous technique to the inverse document frequency [Spärck Jones, 1972] in information retrieval. In information retrieval, inverse document frequency is used to emphasize discriminatory words and ignore words occurring commonly in all documents. Inverse user frequency assigns higher weights for distinctive items and ignores items preferred universally.

Instead of observing the entire database, models can be built that estimate the probability that a user will have a particular vote value for an item. *Cluster* models are based on the expectation that there are certain groups or types of users that share a common set of preferences and tastes. Each user's votes can then be predicted to be of average level within the votes of other users inside the cluster. An alternative to the cluster model is a *Bayesian network* model, where each node corresponds to an item, with states corresponding to the possible vote values. By calculating dependencies between different states in the nodes, a decision trees can be formed from the best predictors.

The collaborative approach solves the major short-comings of the content-based approach: any sort of documents can be recommended regardless of the complexity of their content or similarity to past documents [Balabanovic and Shoham 1997]. Having other users' feedback to influence what is recommended, effective performance is achieved with less effort by single users. However, it also introduces new problems [ibid.]. New items will have to reach a threshold level of ratings before they can be recommended. The usefulness of the system, in some cases, will suffer, as the items

may already be familiar from through other sources, or lost their novel appeal, when they start appearing. Collaborative systems often prefer homogeneous activity. If a user has an unusual taste compared to the rest of the population, there might not be neighboring users that are particularly similar. Also new users suffer the same problem as with content-based systems: some level of user activity is required until sufficient data is generated for the system.

There are several ways to connect content-based and collaborative systems into hybrid systems [Adomavicius and Tuzhilin, 2005]. Both approaches can be developed independently, combining the results to improve performance, or they can be combined in a single model. Sometimes it may be sufficient to merely support the other approach by incorporating some elements of the other. The new item problem in collaborative systems can be solved by including content analysis for novel items. Unusual tastes can be served better if content similarity in considered in addition to common ratings. New users can be served better by allowing them to specify their interests.

As an alternative to user profiles, some recommender systems use *item correlation* data to find matching items or items appealing to certain user groups. Typical forms of correlation data are co-purchases and common customers. Often, only the current interest, not whole history, of the user is considered when calculating correlation. The Amazon patented item-to-item algorithm [Linden et al., 2003] was designed to resolve scaling and privacy issues. The algorithm builds a similar items table by finding items that users are likely to purchase together. Since the purchased item sets of individuals tend to be rather small, and many items have no common customers, the algorithm scales independently of catalog size or the number of customers. This enables producing high quality recommendations with even limited data. As the algorithm requires no personally identifiable data, it satisfies most requirements for user privacy. If the user is using recommender technology for satisfying information needs within several fields or lifestyle enclaves, item-to-item correlation could provide information that is more specified and relevant to the situation.

4.1.3. Input Data In Recommender Systems

J. Ben Shafer and his colleagues [2001] recognize three different types of individual input widely supported by recommender systems applications: *individual data*, *item ratings,* and *transaction history*.

Individual data includes any information pertinent to the user, such as age, gender, location, nationality, occupation, hobbies, education level, health conditions or financial status. Social scientist and marketing researchers often talk about “background variables”. Parents with families are interested in household issues, film enthusiasts are interested in information on films, and people with little financial assets are likely to be

more interested in bargains than high-end luxury. Context-specific data, such as geographic location at a certain moment, can connect the user to the infrastructure of a city, a holiday location, or even a building. A heavy metal music fan most likely will be interested in forthcoming heavy metal concerts nearby. However, the connections between individual data and consumption patterns are complex. Although some characteristics, such as age, gender, or nationality, are unambiguous, providing an all-encompassing ontology for user characteristics that would fully reflect information needs is hardly possible. While it is easy connect a cancer research paper to a cancer researcher, it is no longer as easy to connect a "working-class" person to "working class" music. Even if one could register in a recommender system as, for example, a heavy metal fan, there are tens of sub-genres inside the parent genre, many of which would probably be of little interest.

Item ratings by users can be used to assign quality and topicality. Basically all forms of measurement data (nominal, ordinal, interval, ratio) can be used for generating automated recommendations. Typical forms are simple approval ("dig it", "thumbs up"), numeric or Likert-like (ordered-categorical) ratings, and category or keyword ("tag") annotations evaluating the style of the item or its connection to a specific context. In addition to measurable data, free-form data such as written reviews can be displayed directly to the users. Some systems allow users to target recommendations directly to specific users or user groups, sometimes even outside the system. The ShareThis (http://sharethis.com) plugin offers sharing content automatically in other services, such as Facebook or MySpace, or by email.

Explicit rating requires user action, which may sometimes be difficult to encourage. Instead of demanding additional activity, recommender systems may derive user preferences implicitly, by monitoring transactions. Web pages can be recommended based on the number or duration of views, e-commerce systems can monitor which products are purchased, and media recommender systems can obtain data from media players. However, while this is efficient, there is no actual proof that the user actually finds the item valuable. Browsing items can be accidental or it can be done to serve someone else's needs.

Community data refers to how groups of people collectively perceive the items in question. Recommender systems typically recommend items that are highly rated or regularly purchased within the user community, the user's friends, or other similar users. Even if taste preferences vary across communities, many qualitative attributes, such as style or genre labels, are generally agreed upon: there is little disagreement on issues such as whether a film can be be considered to fit the action, comedy or western genres, or whether the topic of a book is cooking or programming. However, it must be considered that there is always some disagreement among users and fluctuation in the

general opinion over time. What was understood as “heavy metal” or “disco” music in the 1970s, is quite different from how these concepts are understood by fans today.

A common solution for supporting a plurality of opinions, is using free-form tags for content description, instead of controlled, hierarchical ontologies. Collections of user-submitted tags form a ”folksonomy”, a ”user-created bottom-up categorical structure development with an emergent thesaurus”, as defined by Thomas Vander Wal [2007]. Tags are not essentially a means of strict categorization, but rather a loose tool for users to connect items and provide meaning to the information they consume. Tags can be used especially for automatic retrieval, but many services, such as Last.fm, display ”tag clouds”, clusters with visual discrimination (bolding, font-size) representing tag popularity.

The general opinion within any user community of an electronic service is likely to be at least somewhat skewed compared to the general opinion outside of the system. Users of recommender systems sometimes differ from “standard” population, by their age, sex, socio-cultural background, (computer) skills, hobbies and other factors. The opinion of technologically savvy or culturally active early adopters of a system can be overemphasized, while newcomers typically have a short history of data available. Also the (electronic) availability of documents might vary strongly regarding their dating and geographical source.

4.1.4. Output in Recommender Systems

Recommendations can be served in multiple different ways and quantities. Shafer and his colleagues [2001] distinguish between four types of recommender outputs:

The most common type of recommender output is a *suggestion.* Suggestions can be single or multiple items. The benefit of recommending single items, is gathering more attention to the recommended item, and lowering the barrier for user interaction. However, if the suggestion fails or the item is already familiar to the user, the recommendation is of little use. Recommending a set of items lowers the risk of being unable to generate user value but places more burden to the user. Using ordered lists may reduce the burden, but introduces the risk of perceived system unreliability, if the first items are rejected.

Some recommender systems try to present a *prediction* of the rating the user would give to an item. The estimate can present either the user's personal opinion, or that of the community. By viewing predictions of known items, the user can evaluate the quality of the system, and taste preferences within the user community. While suggestions present the user a limited number of items for a specific context, predictions are typically an additional tool for evaluating arbitrary items. Predictions are especially useful as an attachment to suggestions or other item listings.

Besides calculated suggestions and predictions, individual *ratings* of community members can be displayed explicitly. This is especially useful if the provider of the review is known to the user, or if users can view the rating histories of individual members of the community, and to evaluate the reliability of their ratings. Recommendations can also be accompanied with other forms of data that explain individual ratings. If the development in recommender systems follows the trend from mass consumption to individualization, tools for locating expertise, measuring cultural capital, and utilizing social capital, could shift the focus from receiving anonymous predictions to connecting like-minded individuals.

Written *reviews* are less understandable than ratings by machines, but provide detailed information to the user in a natural form. Often explanatory text comments are encouraged in addition to simple ratings. Reviews and text comments can be used as an additional tool to explain single suggestions or ratings, and they may provide valuable information on the rating principles of users. The same items can be used for a multitude of (semiotic) purposes, so it may be worthwhile to describe how specific items are interpreted by those peers whose interpretation would be most relevant to the user.

4.1.5. Other Design Issues

Besides choice of recommendation method and data, Shafer and his colleagues [2001] have identified two major design issues: *degree of personalization*, and *method of delivery.* Two major factors of the degree of personalization in recommender systems are *accuracy* and *usefulness*. Accuracy measures how correct the system is, does it find the relevant items for the user, and does it ignore the non-relevant ones. However, an overly accurate system may be trivial, if many of the highest ranking items are already known to the users. The usefulness of a recommender system depends on *serendipity* – the capability of the system to provide surprising but interesting recommendations, and *individualization* – the degree to which the system provides different recommendations to different users. A *non-personalized* recommender system will recommend the same items for all users in each case. A system with *ephemeral personalization* monitors user navigation and selection, and generates a set of recommendations for each situation. A system with *persistent personalization* creates persistent profiles for users, so the recommendations will be different even if two users navigate into the same context.

Recommendations can be delivered using a *push*/*pull* model, or *passively*, in their natural context. A push strategy can be implemented by sending out recommendations independently of user action. A pull strategy, instead, allows the user to control when recommendations are displayed, for example by explicitly asking the system for

recommendations in a given category. Passive delivery can be used for making the recommendations a part of the overall user experience.

4.2. Recommender Systems as Social Systems

Developers of recommender systems are responsible for providing the material base for the social reality and the array of tools for individual action. They will have to make several decisions regarding the norms and values inside the social system, such as whether to encourage organic or mechanic solidarity, or what rights and responsibilities should users have. An organic society, embracing plurality, might attract a wider array of users and increase serendipity, but a mechanic society, based on similarity and control, may enhance the quality of recommendations in specialist fields. Mechanic and organic societies are also different in their conceptions of privacy, trust, and reciprocity. Different information is shared among friends than between strangers. Besides direct control, user behaviour can be affected by incentives, varying from chances of interaction or social status, to access to premium features or monetary compensation.

In addition to deciding on features, developers of recommender systems will also have to consider the transparency of functionality inside the system. Herlocker et al. [2000] have identified four major benefits in providing explanation facilities to recommender systems for adding transparency. Firstly, explanation facilities provide *justification*. Understanding the logic of the system will help the user in deciding how much confidence to place in a recommendation. Secondly, they encourage *user involvement*, allowing users to involve themselves in the complete decision process by adding their knowledge and inference skills. Thirdly, they provide *education* for users, allowing users to better understand the strengths and limitations of the system by providing education on the recommendation processes. Fourthly, they increase the *acceptance* of the recommender system as a decision aide, by making explicit the limits and strengths of the suggestions.

4.2.1. User Tasks in Recommender Systems

Herlocker et al. [2004] studied the research literature on recommender systems, identifying different types of user tasks. Two types of tasks that have been discussed at length are *annotation in context* and *finding good items*. The purpose of the first recommender systems, Tapestry and GroupLens, was to go through a list of messages adding relevance predictions, while retaining their original context and order. The recommender functionality was added to an already existing messaging system to enhance its basic functionality by providing supporting information. Sometimes the ”worst” items were completely removed. A typical contemporary annotation

mechanism is allowing users to assess relevance for links to news, comments or other items on a web page, and to view the assessments of other users to decide whether to follow these links. The systems following Tapestry and GroupLens, such as Ringo and the Bellcore Video Recommender were concentrated more on what Herlocker et al. [2004] consider the core recommendation task. They provided the user with a ranked list of specific recommended items, along with predictions on how much the user would like them, expecting the user to find some novel items on the list.

Besides annotation in context and finding good items, Herlocker et al. [2004] have listed several other generic tasks, not as well discussed in the search literature. While recommender technology is often used for simple entertainment with the user being satisfied to find a couple of interesting items, sometimes the user can not overlook the rest of the potentially interesting items. Instead of finding some good items, a user may want to *find all good items.* A lawyer, for example would want to go through all the relevant material concerning a trial.

It is not always useful to list the recommended items in their order of relevance or to retain their original order. Sometimes the result of the recommendation process is a specifically ordered list of items, a *recommended sequence*. A number of music recommender systems provide radio streams of musical items that are predicted to sound pleasant while listened to in a specific order. Another example could be listing research papers to learn about a given field, first in introductory manner, and then going into details.

The accuracy of predictions is not always the main goal for recommender technology, since it is often used as a light leisure activity. Providing entertaining interfaces for *just browsing,* with a low threshold of usage, and concentrating on the ease of use, can sometimes be highly more important than impressive algorithms.

Sometimes users are not looking for actual recommendations, but instead testing the systems themselves by inserting their favorite items, playing with the available parametres and checking the results in the hopes of *finding a credible recommender*. A successful recommender system should appear to the user as a credible one. An elaborately tuned-up recommender system may fail to appear trustworthy to users if none of the recommended items are familiar to and already approved by the user.

A successful collaborative recommender system requires that the users are active, and can not function unless the users keep on providing ratings. Herlocker et al. [2004] introduce several different rating tasks. Most recommender systems assume that users will contribute ratings because they believe that it is useful. User often want to *improve their profiles*, expecting to also improve the quality of the recommendations. A profile, as the virtual habitus of a user is material base for their existence within the system. Sometimes users are more interested in the rating of items to *express themselves,* than

receiving recommendations, as can be seen in the extensive reviews contributed on sites like Amazon. Issues affecting the pleasure of self-expression include the degree of anonymity and the ease of making contributions. Some users prefer to keep their anonymity, while others have extensive public profiles. Similarly, some users are interested in contributing in-depth analyses of items, while others prefer single clicks of approval. Besides performing their own tasks, some users want to *helping others* in the user community, believing that their contributions will aid their fellow users in their tasks. Recommender systems need to consider means for encouraging communality and reciprocity. Recommender systems can also be used to *influence others,* often by advocates of certain producers or genres to increase the popularity of specific items as a marketing tool. An example is providing high ratings of movies before they are released, in order to persuade users to go and see them. This presents a common problem, that developers of recommender systems try to tackle.

4.2.2. Trust in Recommender Systems

Recommender systems and collaborative filtering can be seen as extending the ways in how people make decisions based on our everyday interactions with each other. However, while we usually know our everyday social recommenders personally, or at least have several ways to estimate how trustworthy their opinions are, automated collaborative filtering systems seldom have this functionality. Recommender systems typically require additional trust control. As in any community, decisions regarding suppressing deviant behaviour and rewarding achievement need to be made. Some users may have too little competence in making reliable evaluations, and some may directly misuse the system. Recommenders in virtual environments can also be completely anonymous or even using falsified identities to manipulate us [Mobasher et al., 2007].

How trust should be addressed, depends on the type of the community. Members of a mechanic community know each other personally, share the same values and interests, and may stand in opposition to outsiders. In a mechanic community, trust and deviance are controlled by imposing strong sanctions and promoting hegemonic values. In an organic society, trust is based on the interdependence of citizens, and reflexivity allowing social and cultural dynamics. Instead of a fear of sanctions, proper behavior is encouraged by freedom of expression and benefiting from the large array of other individuals.

The problem of trust can be seen as a question of information asymmetry: To fully benefit from recommender systems, we must solve problems of how to signal the quality of the system, and screen the expertise and benevolence of users. Systems should provide users means to easily eavaluate the competence of their fellow users, in

order to locate the most valuable information providers. Enabling users to signal their competence by providing high-quality recommendations, could also encourage them to share expertise. Assigning a special status or ”recommendation points”, or otherwise explitly stratifying users, could encourage competition between users. On the other hand, if poor recommendations are directly visible to other users, users may risk their status if it is not based on expertise.

A special type of social recommender is a reputation system. Reputation systems are based on rating of users and their collections as including typically relevant or less relevant documents [Resnick et al., 2000]. A famous application is the PageRank algorithm, developed by Sergey Brin and Larry Page [1998] during research about a new kind of digital search system at the Stanford University, which would later become the leading internet search technology company Google (http://www.google.com). The PageRank algorithm elaborates search results by assigning more relevance to pages with inbound links from other documents, regarding them as ”well-reputed”. Page and Brin used a citation analysis method from the field of bibliometrics to assign additional relevance to hypertext documents in the web. In bibliometrics, citation analysis is typically used to estimate the meritability of scientific articles by calculating how many times they are referred to in other articles, especially those published in high quality refereed publications. For trust-critical applications, the trust for single users can be made explicit. In the eBay (http://www.ebay.com) online auction and shopping service, buyers and sellers are allowed to rate and comment each other. Other traders can then view their profiles for estimating reliability before approaching them.

4.2.3. Recommender Systems as Economic Systems

A recommender system can be seen as a system for exchange. There are a number of parties who have interests in recommender systems: system developers, users, and item stakeholders (producers, competitors, advertisers, fans, haters, political activists). Users profit from the systems by getting their information needs served regularly, and possibly gaining recognition through successful recommendations. Service providers profit by increasing their appeal and sales. Other stakeholders may use recommender systems as marketing tools. Resnick and Varian [1997] have identified two major incentive problems. Firstly, most users are not contributing data to the system. It is easy to free ride by consuming evaluations by others. Using implicit data solves this partly, by allowing a low-barrier involvement, but in some cases incentives, such as requiring contribution or providing monetary rewards for users, might be needed. Secondly, content owners may generate mountains of positive recommendations for their own materials, and negative recommendations for their competitors.

Recommending items can generate capital in many non-financial modes. Sharing information resources may generate social capital by acknowledgement of the contribution, displaying good taste or knowledge generates cultural capital, and individuals often get pleasure just by ”investing in their maps of mattering”, as Grossberg [1992] puts it. The recommendation can be a challenge in the form of potlach reciprocity, a display of competence awaiting for a reciprocal answer in the form of an equally competent recommendation. The main task of a recommender systems may often be effectively generating cultural and social capital to users.

Rafaeli et al. [2004] have developed models for social and cultural capital within virtual communities. In these models, capital is measured by calculating dyadic relations between users, based on reading the same message. Two measures are introduced: overall social capital within a community as the total number of dyadic links, and individual cultural capital as the total number of links for a user. Although these measures can reveal information about the level of activity inside the community, or the breadth of information acquired by an individual, they tell little about the nature of these social relations or the ability in judgement of users. Cultural capital, for Bourdieu, is not simply a static, acquired asset, but it is constantly negotiated. The cultural, distinctive value of an item decreases along with its novelty. Furthermore, taste assertions can even be negative. As well as taste, cultural capital is often displayed through distaste.

To comprehensively evaluate cultural capital, systems should address the overall or field-specific quality of the recommendations. Partly, this can be considered the same as success in personal recommendation or early adoption of a highly rated item. Receiving recommendations determines how capital is generated to the recommender. By accepting and acknowledging recommendations, individuals can confirm the value of the recommender and the investment. And vice versa, by not accepting the recommendation, the recommender may be “put to shame”. Furthermore, individuals can confirm the value of their own investments through recommendations based on their user profiles. Adopting Bourdieuan concepts, we could divide cultural capital into three types: embodied (ability for judgement), objectified (preferred items), and institutionalized (recognition inside the community).

As reciprocal action, providing and receiving recommendations are inseparably combined. The recommending party expects a reciprocal act: an approval, a reward, or a rejection. Social and cultural capital can thus be measured in terms of whether an act triggers a certain kind of reaction. There are two basic motives for engaging in exchange: a social motive for interaction, and an economic motive for profiting. A recommendation is made and approved of because the item is considered valuable, but also because there is a general motivation for giving it. If it is not approved, it may be

either because it is not considered valuable, or because the user does not acknowledge the recommender. Gürsel and Sen [2009] consider that, in reality, many will not want to receive recommendations from unknown people. Users prefer recommendations from people who they can share these experiences with. Gürsel and Sen propose a model for social networks, where trust is assigned transitively between users that are close to each other.

Like goods can be shared reciprocally either between individuals, or an individual and a community, recommendations can be targeted towards individuals or communities. This raises the question, whether the reciprocal debt should be between individuals, or an individual and a community. The community can repay the debt by simply contributing good recommendations and togetherness, an individual might have to make a more specific re-recommendation, or reciprocate in some other way than recommendation.

From the part of the system developer, the motivation behind taking part in the economy of the system is typically at least partially monetary. Ulrich Rabanser and Francesco Ricci [2005] have identified several possible business models for recommender systems. A *brokerage* system profits by bringing buyers together and facilitating transactions. A recommender system can also be used for selling opportunities for targeted advertising to companies, as there is often significant amounts of personal data concerning users' consumption habits. An *infomediary* system profit by selling valuable information gathered about consumers and products. A *merchant* model is typically connected to a situation where the system is used to support sales by the company. An affiliate can provide purchase point opportunities, charging a sales commission. A recommender community can be established through reciprocal means. The systems can be developed as an open source project, while selling integration and support services. Funding may even be acquired through fan merchandise or voluntary contributions. A *subscription* model works by charging a periodic fee. Often, while the system is otherwise free to use, "premium" content can be charged for.

In addition to social norms and values, developers of recommender systems need to decide on the economic model of the system: will it be a centrally controlled economy (system provides recommendations), a laissez-faire market economy (individuals recommend freely and equally), or a Keynesian mixed economy with limited features of control. Technically, this means choosing whether users will be communicating directly or with the system as a mediator, and whether incentives are to be used to encourage specific behaviour. Developers of recommender systems should not merely consider how users can accumulate knowledge capital by tools that efficiently locate useful information. Instead, they should look at the different ways in which information

exchange, both giving and receiving information, is valuable to users. It may be necessary to look beyond traditional economic models. If we are to believe Drucker [1993], the post-industrial society is becoming a post-capitalist society, based on a non-socialist and non-capitalist model of economy.

4.2.4. Cultural Consequences of Recommender Systems

The growth in number of different lifestyles and scenes has created alternative economies for investing in social and cultural capital. Traditionally, these economies have been characterized by a notably unequal distribution of economic, social, and cultural capital. Many cultures have even fostered the distinctions. Increasing possibilities for networked information exchange will affect all forms of capital by providing wider access to goods, means for communication, and tools for signaling and screening different lifestyles. Increased networked communication alters the situations for all parties: producers, intermediaries, and consumers. Consumers and producers will no longer be fully dependent on intermediaries, as they can communicate directly. If expertise or other intermediation is required, a wide array of candidates can be located in the networks. In the networked information economy, it is easy to develop and share expertise. As a consequence, it may also become a necessity. With increasing social connections, the need for cultural capital becomes evident. It is an essential source of competitive power in a networked society, where the ability to create connections between heterogeneus individuals guides the economy.

Socialization and reciprocity is no longer necessary for consuming subcultural items or gaining subcultural capital. Scenes display themselves in the internet, where any interested individual can view their styles, purchase their goods, seek their locations, and read their views. Displaying subcultural distinction becomes more difficult, as styles are immediately transmitted in the networks. Instead of a certain identity, a given set of commodities or other signs may merely signify interest in fashion or a play with styles. For deeply committed subcultural members, an increased heterogeneity within scenes may induce anomie or alienation, as norms inside the social environments are broken, and the semiotic value and ownership of subcultural signs is transformed. Recommender systems have a double part in this process. By providing information to ”outsiders”, they simultaneously create value by attracting investing users to signs and commodities, but also decrease the distinctive cultural value of signs and commodities, as less labor is required for obtaining them. On the other hand, recommender systems may also introduce new cultural connections to products that have been traditionally directed to a mass audience. Like subcultural bricoleurs in the industrial era, users can find new uses for goods, and spread these to other users with similar interests.

Especially recommender systems developed to expose marginal scenes and subcultures should address this double function. Individuals driven by strong communality and distinction may react negatively towards exposure without reciprocity. Recommender systems should address this expectation of reciprocity by offering tools that help to develop the scenes and communities that provide information to the systems. Recommender systems can help in community building by offering chances for better interaction and mapping the public identity, history, and canons for subcultures and scenes. Users can be allowed to create exclusive, self-managed interest groups, as well as public identities for managing and displaying their involvement in different lifestyle enclaves.

5. Conclusions

5.1. Summary

A number of conclusions can be made from this study. It can be argued that the structures of social, cultural, and economic interaction are in a process of change, and several trends can be observed: a trend towards plurality introducing a large array of choices in available lifestyles, a trend towards informational democratization through increased access to information, and a trend towards networked economic activity.

With increased networked communication, traditional cultures and subcultures are turning into lifestyle enclaves and scenes, where individuals with shared interests can participate in different ways, without the requirement of continuous commitment. This may redefine the logic of subcultural capital, or the "game" inside the "field", in Bourdieuan concepts. A networked model of economy has been typical for many subcultures and scenes, where peer production and amateur media have emerged as an alternative to the dominant mass culture. The internet is expanding this model into numerous areas of life, as well as providing tools for enhancing grassroot level economic activity. While recommender systems are strongly contributing to these trends, studies in recommender systems rarely address the issues.

Consumers have been constantly struggling between the needs created by everyday life, and the compromised, mass-produced solutions that satisfy these needs. It is obvious that personalization technology, such as recommender systems, can help in this struggle, by producing value that efficiently targets the needs of individual consumers. The question remains, will consumers be willing to engage in exchange with these systems, and under which terms. If consuming goods is considered as a social act, the value of the social practice may exceed the value of the actual good. Without a sense of continuous interest and community, recommender systems may be left as curiosities.

Some form of continuous reciprocity is required from the systems, if users are expected to continuously provide information. If the labor of users provides the developers of the system chances for huge economic profit, they may begin to expect sharing of this surplus value. In addition to opportunities for gaining social and cultural capital, those who are richest in these assets may require further compensation. Although, if the system is driven by mutual, communal interest, the generated good-will might be enough to encourage reciprocity even within the expert users.

5.2. Recommendations for Further Work

This work has provided an introduction to some important social and cultural issues related to information exchange and recommender technology. To fully take advantage of sociological theory, frameworks for economic, social and cultural action with explicit concepts would be needed. At the same time, we must also consider the representativeness and validity of these theoretical models. To evaluate the applicability of theoretical models in different conditions, a number experimental studies would be required.

By better operationalizing concepts like social or cultural capital, algorithms could be developed that better correspond to the social reality of users, as extensions for current libraries. Besides developing new algorithms, sociological theory could be used for analyzing existing recommendation algorithms. Technical features in recommender systems are creating practices that affect our social reality in multiple different ways.

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