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ZOLTÁN OSZKÁR SZÁNTÓ

SOCIAL FUTURING – AN ANALYTICAL CONCEPTUAL FRAMEWORK

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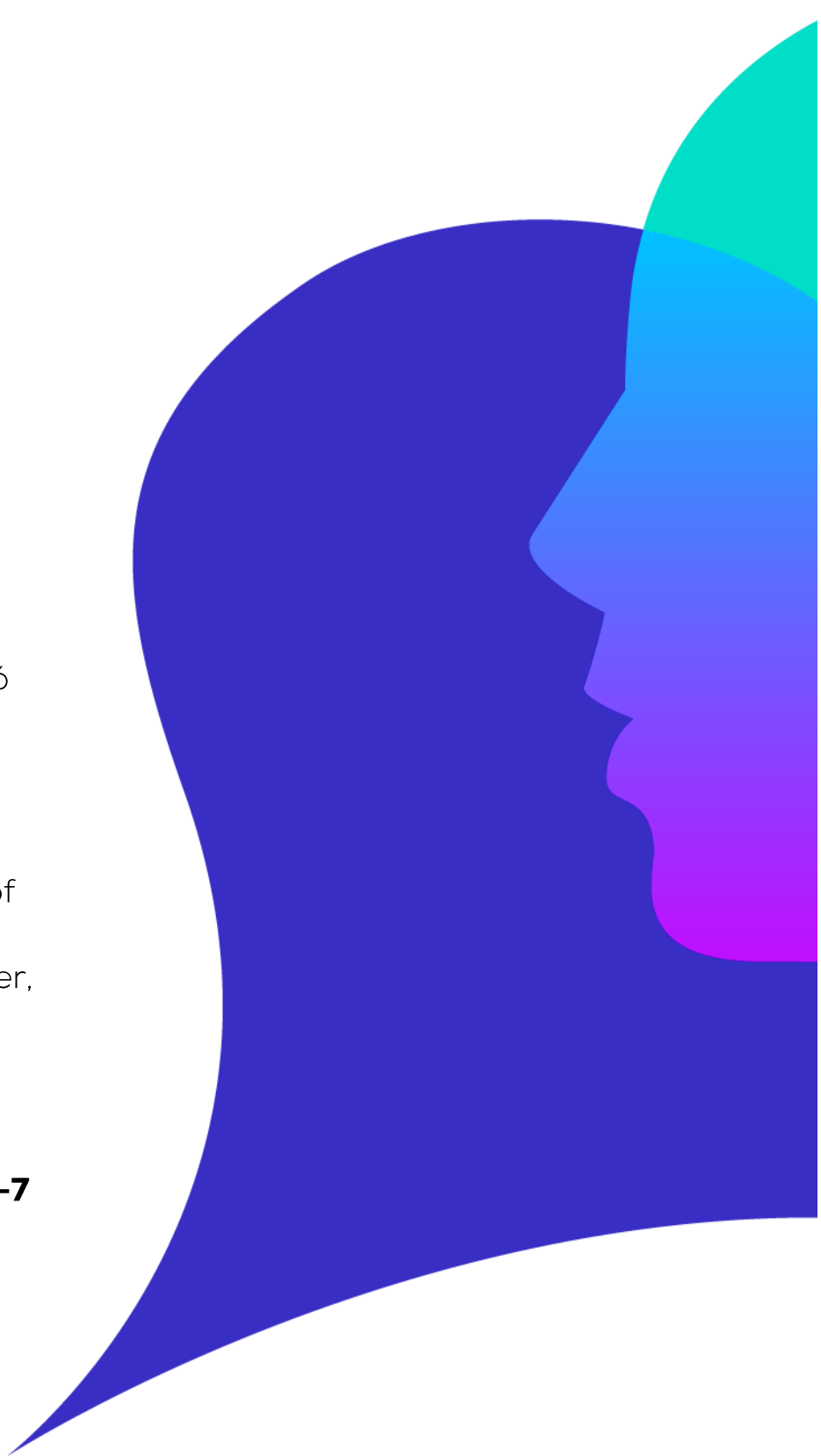
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1. INTRODUCTION

*"Our task is not to predict future,
But to prepare for it"*

Perikles

As I see it, social futuring¹ is the very feature of an arbitrarily chosen social entity that expresses its potentials, ability and competence

- to interpret, envisage, influence and generate future changes and to
- prepare for their strategic treatment, that is, awaiting for the challenges stemming from changes (be they limits/opportunities or threats) with full preparedness.

One may encounter expressions like future proofness, future orientedness, resilience and adaptation in the semantic surroundings of social futuring. Many associate futuring with futures studies, while others associate it with sustainability or even competitiveness.

The term "future proofness" for example in architecture denotes the need to account for long-term functionality when designing and constructing buildings or settlements. It is now used in a broader sense, albeit mostly in technical and technological contexts (e.g. software, memory, workforce, future proofness in project management).² Future-orientedness refers to a general human mindset counterpoising mainly past- and present-centred attitudes.

¹ I would like to express my gratitude to Petra Aczél, Loránd Ambrus, Márton Barta, Tamás Bartus, János Csák, Róbert Iván Gál, Eszter Monda, Annamária Orbán, Péter Szabadhegy and Balázs Szepesi for their valuable comments on the earlier version of this study, discussed at the workshop debate. However, the author takes all responsibility for everything written down here.

² For a comprehensive study on the notions of futuring, resilience, future-orientedness and future proofness, see: Aczél 2017.

The exact meaning of resilience, a term taken from psychology, is difficult to explain with one word. It simultaneously means flexibility, adaptation, and the ability to cope and withstand. This term nowadays is applied to characterise not only people, but organisations, materials, systems, eco-systems etc. Likewise the concepts above, the term "adaptation" suggests a certain passivity which would, to my mind, make the conceptual horizon of futuring to be examined too narrow and too lopsided.

The concept of social futuring only relates to futures studies inasmuch as it relies on the methods and certain findings of the former in reflecting on future changes.³ As we all know too well, the widespread and clearly defined notion of sustainability is a product of environmental studies, and it is used by researchers chiefly in ecological contexts. There is, however, a correlation here, too: though completely different studies, environmental sustainability and social futuring still have many things in common.⁴ The same can be said about the relations between economic competitiveness and social futuring.

The Social Futuring Research Centre of the Corvinus University of Budapest took a purposeful new direction with its dedication to working out concepts of social futuring. To focus on "social" aspects, as the prefix predetermines, future oriented scientific and political streams are intended to be put into wide, multi-layered and complex contexts, ranging from settlements and institutions/organisations to states/nations, also taking their alliances into consideration. With a well-defined notion of "futuring" we shall also have the opportunity to grasp multiple ways of interpretation and performance all at once, while taking into consideration (geo)political, technological, socio-economical and cultural-spiritual aspects on a multidisciplinary and interdisciplinary basis⁵.

³ The correlations of futuring and future studies are explained in detail by: Monda (2017).

⁴ The conjunctions of sustainability and futuring is discussed by: Kocsis (2017).

⁵ Ablonczy (2017) summarizes how the idea of futuring appeared in the writings and activities of three outstanding Hungarian historical persons, namely István Széchenyi, Miklós Bánffy and Zoltán Szabó.

By unfolding the details of the minimal definition mentioned in the first paragraph,⁶ an ideal-typical notion of social futuring will be defined analytically, limited to using the terms set as conditions. Firstly, as *per definitionem*, we shall differentiate the

- conjunctive (or complex), i.e. necessary conditions
- and disjunctive (or alternative) i.e. sufficient conditions of social futuring.

Then, starting out from the ideal-typical definition – and also regarding the wide circles of social entities as possible subjects of social futuring as well as the various changes to be expected in some point in the future – the three basic forms of social futuring will be defined along with their variations and subtypes.

In the course of defining the conceptual framework⁷, aiming for a maximal notional accuracy and clarity, definitions and types will first be outlined, then illustrated with examples, and, finally, adjusted by adding simple logical markings (formal adjustment) and simple figures. The system of analytic definitions will hopefully make the complex framework of social futuring more comprehensible and followable to everybody, serving as a compass for finding our way in the notional "maze".

This conceptual priming is further justified by the fact that – since the concept of social futuring has innumerable layers of denotations and connotations and as such, it is an umbrella term in a certain sense, separating these layers⁸ would enable the designation of the main directions in the empirical research of social futuring: it would operationally contribute to a detailed plan to create a social futuring index.

⁶ We shall follow Ian Morris (2013) who, on the basis of a minimal definition of social development created an ideal-typical definition, and defined the pillars of a social development index.

⁷ László Bertalan's selection presents the logic of term coining and classification procedures in detail.

⁸ This method of making a notion more accurate is referred by scientific philosophy as a typology-based explication of scientific terminology. See: Bertalan (2005).

2. THE IDEAL-TYPICAL NOTION OF SOCIAL FUTURING

*" A clever man is not the one who
gives good predictions about the future
but the one who sees clearly that predicting the future is impossible,
but, keeping that in mind, a clever man can still adapt to the future in advance."*

László Méré

By definition, a conjunctive (or complex) necessary condition of the futuring of an arbitrarily chosen social entity (SE) is that it has

- self-consciousness, a constitution⁹ (NC₁), and
- it is able to operate functionally (NC₂), and
- it is able to sustain and reproduce itself over a longer period of time (NC₃), and
- it is able to act and organise itself in order to influence its future environment and operations – based on a strategic view – and to prepare for organising the ways to act (NC₄).

Meeting all the above conditions *simultaneously* – as I see it – *enables* the creation, sustenance and growth of the social futuring (SF) of any social entity, at least as far as the necessary conditions are concerned. In other words, the simultaneous existence of the above factors creates an opportunity to social futuring, while the lack of one or more of them makes it unfeasible.

If, for instance, the original population of a country or settlement is in serious decline for some reason, its long-term prevalence may become questionable (e.g. ghost towns or settlements with a population switch). If an organisation or an institution is unable to run

⁹ In philosophy, constitution is an ontological category, a constitution of existing organisms from existence and essence, action and potential, material and form. The feature of self-definition and constitutional existence of an entity in a political philosophical sense.

its basic duties continuously under changing circumstances, it may lose the capacities of functional operation (e.g. enterprises losing market share, emptying institutions). If a political organisation does not have a strategic image of the future and if it is not strong enough to organise strategic methods of acting to reach its goals, it may be squeezed out or it may fade out from the political contest and as a result, it may lose its significance (e.g. political parties losing their voters' trust, trade unions losing their members, dying non-governmental movements.)

Formally: (SE) [$NC_1 \wedge NC_2 \wedge NC_3 \wedge NC_4 \rightarrow Df \rightarrow SF$]

Per definitionem, it is true for all social entities (SE) that their successful futuring requires the potential of a self-conscious, constitutionalised existence (NC_1), and functional operation (NC_2), and long-term sustenance/reproduction (NC_3), and the preparedness for self-organisation/ the organisation of strategic actions (NC_4).

In other words, the *per definitionem* conjunctive (or complex) necessary conditions of social futuring are self-consciousness and constitutionalised existence (NC_1), long term sustenance/reproduction (NC_2), functional operation (NC_3), and preparation for self-organisation/ the organisation of taking strategic action (NC_4)

If all the necessary conditions are met, the futurability of social entities is secured by agents and their groups who are able to realise various attitudes in order to adapt to expectable changes in any point in the future.

By definition, the disjunctive (or alternative) sufficient conditions of successful futuring of any social entity are the following:

- the entity must be capable of making changes (SC_1), and/or
- the entity must be able to prepare for influencing expectable change (SC_2), and/or

- the entity must be able to prepare for the neutralisation/exploitation of the limitations inherent in expectable change (SC₃), and/or
- the entity must be able to prepare for addressing the risks of an expectable change. (SC₄)

If all, one or some of the above conditions are met, regardless of combination, social futuring can be regarded as secured, and its various forms will be created, maintained and improved. If, for example, a nation (e.g. Turkey) or a large corporation (e.g. TESLA) can prepare itself to generate/influence a specific, expectable geopolitical change (e.g. international migration crisis) or a specific technological change (e.g. the spread of self-driving cars) respectively, they can be regarded as being successful at futuring, likewise are regions and cities that are able to prepare for the risk management of environmental changes (e.g. climate change, global warning), or capitalise on the opportunities of technological advance (e.g. Smart City, Slow City).

If none of the sufficient conditions are met, it can be argued that the creation, sustenance and growth of social futuring is impossible, at least as far as the sufficient conditions are concerned.¹⁰ For instance if a country is unable to generate/influence any demographical, technological or environmental change, be they either threats (e.g. decreasing population, ageing society, climate change) or opportunities (e.g. robotic mechanisation, artificial intelligence), and cannot prepare to address these changes strategically, they seriously lag behind in social futuring. We may also add that the more of the four conditions above are met by any given country or social entity, the stronger at social futuring they are.

¹⁰ Note that the necessary and sufficient conditions are regarded separately. I shall make no effort to make a list of "necessary-and-sufficient" conditions. Consequently, conjunctivity and disjunctivity are regarded separately. At the same time, in our view, the alternative sufficient conditions may ideal-typically be considered only if the complex necessary conditions are met. In the course of doing empirical research, the main question will naturally regard the conditions the social entities (the "real types") in focus meet, based on which comparisons and rankings can be set up. This is the very reason for which ideal-typical notions are sometimes referred to as "line notions" in philosophy of science.

Formally: (SE) $[SC_1 \vee SC_2 \vee SC_3 \vee SC_4 \rightarrow Df \rightarrow SF]$

Per definitionem, all social entities are successful at futuring if they have the potential to generate change (SC₁), and/or to prepare for influencing expectable change (SC₂), and/or to prepare for the neutralisation/exploitation of the limits in expectable change (SC₃), and/or to prepare for tackling the threats of expectable change (SC₄).

In other words: the predefined disjunctive (or alternative) sufficient condition of social futuring is the potential of making changes (SC₁), and/or preparing for influencing an expectable change (SC₂), and/or preparing for neutralising limits/ exploiting opportunities of an expectable change (SC₃), and/or preparing for tackling the risks of an expectable change (SC₄).

3. WHICH SOCIAL ENTITIES?

*"Future belongs to the generations and nations
which are willing and strong enough to meet it."*

Max Planck

The social entities in focus are constituted by persons who are given the ability of interpreting things, taking decisions and taking action, and who are "embedded" into various groups and social networks (e.g. families, communities based on blood, common interest, collegiality or cohabitation etc.).¹¹ They and their groups are the potential "champions", key figures, i.e. agents of creating and increasing social futuring. Such social entities can for instance be:

- organisations (O), institutions (I),¹²
- settlements (Se), regions (R),
- countries (or country groups) (C), societies (So), and nations (N).

Along various viewpoints, these social entities can be subdivided to further subtypes. For example, we can differentiate for-profit and non-profit organisations, social, economical and political institutions, and identify further subtypes within them (e.g. the state and the parties within political institutions) or specific cities, regions, countries and nations. And so on.

The circle of potentially futable social entities may be enlarged along certain research aspects. However, when doing futuring research of any kind, one must make the most accurate and unambiguous selection from the vast set of social entities and choose the entities which are the most suitable for the particular

¹¹ Here I rely on the popular socioeconomic concept of Mark Granovetter (2017).

¹² The notion of institution is used here in the sense Douglass C. North defined it: "Institutions represent the rules of society... the boundaries people made to regulate the interaction between people." (North, 1990) examined the role of institutions with regard to futuring: Bakacsi (2017b).

analysis. For example, the elements taken for a comparative analysis of the social futuring of certain countries are different from the elements picked for analysing the social futuring of, say, business enterprises, political systems or settlements.¹³

Formally: $SF = F_{SE}$, where $SE \{O, I, Se, R, C, So, N, \dots\}$

The set of futable social entities (F_{SE}) contains various elements: organisations (O), institutions (I), settlements (Se), regions (R), countries (or country groups) (C), societies (So), nations (N), etc. and various subtypes thereof.

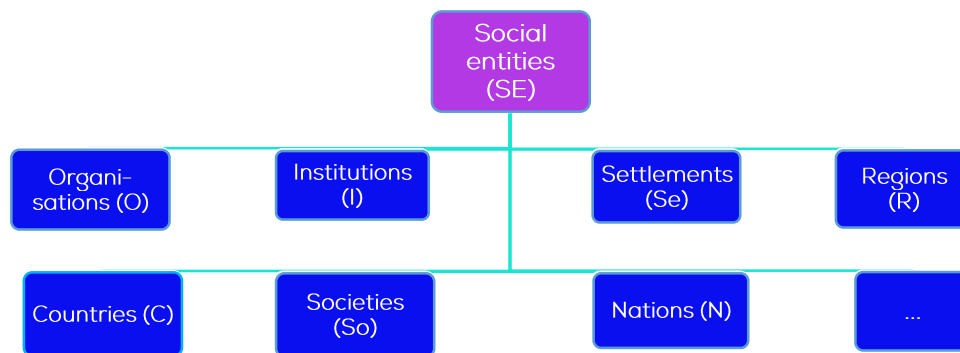


Figure 1: Types of social entities

It must be stressed again, referring back to the first paragraph, that a research of different social entities can never commence without clearly designating and separating the actual and/or potential agents who create and secure futuring.¹⁴ No matter if they are persons ("champions") or groups, the basic question remains the same in all cases: have they prepared, or how are they able to prepare for creating the circumstances of short-, mid- and long-term social futuring? It should also be examined whether the size of agent groups have reached the "critical mass", which is indispensable for the activities securing self-sustenance to futuring.¹⁵

¹³ Social entities may also be interpreted as social networks from the aspect of network science and network analysis (Barabási 2002, 2010, 2016). For details see: Bakacsi (2017a., 2017b). See also: Parag, 2016.

¹⁴ For details, see Szepesi (2017).

¹⁵ „Critical mass” is used in the sense Thomas C. Schelling put it: "... common to all models of critical mass is that certain kind of activity that becomes self-sustaining after having reached a minimum level." (Schelling 1978). It should be noted here that the successful futuring of persons and smaller social entities (e.g. organisations) do not necessarily imply the successful futuring of

4. THE BASIC FORMS OF SOCIAL FUTURING

*„Future is not in our power entirely,
but it is not entirely outside our power either.”*

Epicurus

Interpretating, generating and elaborating on expectable future changes, including the preparations to influence them are termed as proactive (Pa) social futuring. A common feature of these methods of action is that they invariably target changes directly, and the agents of social entities manipulate the changes according to their common objectives and interests, or at least they are prepared to do so: they aim to generate changes which are desirable for them, and try to hinder undesirable/disadvantageous changes or place obstacles in their development.¹⁶

This basic form of social futuring may be characterised as a specific manifestation of strategic creativity, because here a particular social entity attempts to shape future in a creative way, respecting the limits and the circumstances. For example, if a country realises its unfavourable demographical tendencies in time, it may take innovative actions in its demographic and family policies in an attempt to influence them. Or, a country group may bring provisions to combat global warming by implementing new energetic and

larger entities (e.g. countries) – it may be called the "problem of aggregation". These issues are not to be examined here in detail, nevertheless, they will not be disregarded. I shall try to elaborate on them later, in the empirical research phase.

¹⁶ Normative benchmarks will help us decide whether a change is "desirable" or "undesirable" For a normative framework of our research project, based on ethical and political philosophy, see: Ábrahám 2017, Csák 2017. The changes envisaged may bring present conditions closer to the desired social conditions, and they may also put distance between them. A desirable social condition can nevertheless be depicted by using normative standards. This also means that the "... analytic and normative concept of social futuring cannot be separated from one another." (Ambrus 2017d: 3)

environmental policies. Both of these are proactive and creative steps to secure futuring.

However, if the potential agents of social entities prepare for neutralising the limitations of future changes and/or harnessing advantageous opportunities, we speak of *active* (A) futuring. Considering the same example as above: if the country group is unable to slow down the process of global warming, it may still exploit its advantages by the application of active futuring. In practice, this may mean taking creative steps in energetic policy, such as setting vast amounts of solar collectors in operation. Or a business/institution specialising in healthcare may prepare in time for the opportunities of technological changes (e.g. the spread of nanotechnology) by applying new treatment methods, which is another example for active futuring. These cases are also characterised by a sort of strategic creativity: the ability to grasp the envisaged opportunity in a creative way, and in the right time. Here, however, action does not target the change itself but aims at the possible outcome of the change instead, also in an innovative way.

Finally, if the social entities address the threats inherent in certain changes, a *reactive* (Ra) futuring is taking place. Rather, it is a sort of strategic adaptivity inasmuch as actions reacting to unavoidable future threats pop into the foreground, which often take the form of adaptation or resilience. Taking the above example further: if the country in question cannot influence the demographical processes directly, it can still prepare for the strategic treatment of their risks, for instance by taking administrative steps in the regulation of the labour market or the pension system. This is reactive futuring. Or, if a country prepares for the minimisation of geopolitical threats (e.g. in conflict zones), it may join alliances or arm itself since it cannot influence the threats directly. These are possible cases of reactive futuring, too.

By this, we have defined the three basic forms (Bf) of social futuring, which - taking the broad set of possible social entities and the various expectable changes in account - can be combined with further subtypes.

Formally: $F_{SE, Bf}$, where $Bf \in \{Pa, A, Ra\}$

The set of social futuring contains three elements: the proactive form (Pa), the active form (A) and the reactive form (Ra).

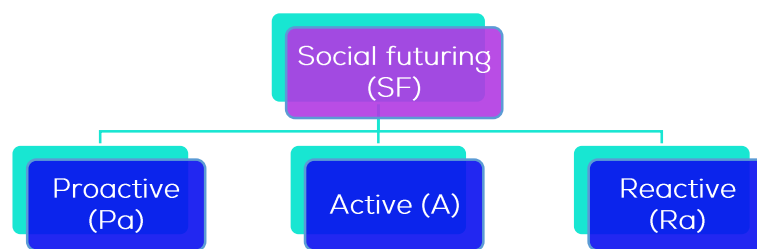


Figure 2: The basic forms of social futuring

5. WHAT CHANGES ARE TO BE EXPECTED?

*"Future" does not really exist in singular.
We may only speak about innumerable unforeseeable futures
which will be able to surprise us all the time."*

Niall Ferguson

Expectable future changes (EC) may be classified from many aspects. Groupings can be made from viewpoints of their contentual aspect (i.e. substantivity), prediction-based aspect (i.e. predictability) and time-related aspect (i.e. temporality).

In order to conceptualise social futuring further, the expectable future changes can also be classified by regarding the broader sphere in which the changes take place or will take place. Regarding the contentual aspect of expectable change (ECC), we may differentiate between

- ecological-(geo)political (EGp),
- technological (T),
- socio-economical (SE), and
- cultural-spiritual (CS) changes, to highlight only the most important ones.

On the one hand, classification is not comprehensive, i.e. it does not encompass all the possible kinds of expectable change, however, it does refer to the types of change that are of key importance in the research of social futuring. On the other hand, the particular types are comprehensive enough to enable us to make more subtle and detailed distinctions in specific fields of change.

The notion of ecological-(geo)political change includes the expectable global balance of natural resources, geographical location, and the political shifts stemming from these two,¹⁷ global climate change as a result of human activity, biodiversity, and the availability of natural resources (especially the shifts in the world's freshwater supplies).¹⁸ It also spans over the shaping of political systems of societies in the future (e.g. democratic-dictatorial shifts, changes in political stability and security, the shaping of political integrity and sovereignty).¹⁹

With the notion of technological change, tendencies and trends shaping the artificial-material world and the accelerating technological processes are intended to be grasped. In particular, the spread of robotic mechanisation, artificial intelligence and nanotechnology belong here, all of which radically change human activity and lifestyles (especially work).²⁰

Trends in popular movement are certainly socio-economical²¹, including the changes in childbirth and mortality rates and those of (international) migration. To our mind, urbanisation²² and social mobility also belong here, as well as tendencies like changes in competitiveness, and also trends in education and healthcare.

With the notion of cultural-spiritual change I intend to grasp worldwide tendencies concerning changes in the existence of entities, manifested in the entities' symbols, values and norms²³, as well as international processes in communication, trust and religion.

¹⁷ The notion of geopolitics are used in the spirit of George Friedman's classic work (2012, 2015, 2016.). Connectography represents a new approach of mapping the future of global civilisation along with its network-based methodology. See: Khanna 2017.

¹⁸ For the correlations between ecological sustainability and social futuring, see: Kocsis (2017).

¹⁹ For a futuring-based interpretation of long-term political strategy, see: Ambrus (2017a, 2017b, 2017c).

²⁰ For a summary of expectable technological change, see: Iván (2017).

²¹ In the topic of childbearing and ageing societies, see: Bartus (2017), Gál (2017).

²² About the future of cities, see: Alföldi (2017).

²³ "The modern state also has a spiritual and a symbolic function. These are indispensable to make citizens conscious of their citizenship" (Manent, 2003: p. 54).

Formally: $F_{SE, Bf, ECC}$, where $ECC \{EGp, T, SE, CS, \dots\}$

The set of expectable changes relevant to social futuring contains four contentual elements: ecological-(geopolitical) change (EGp), technological change (T), socio-economical change (SE), and cultural-spiritual change (CS).

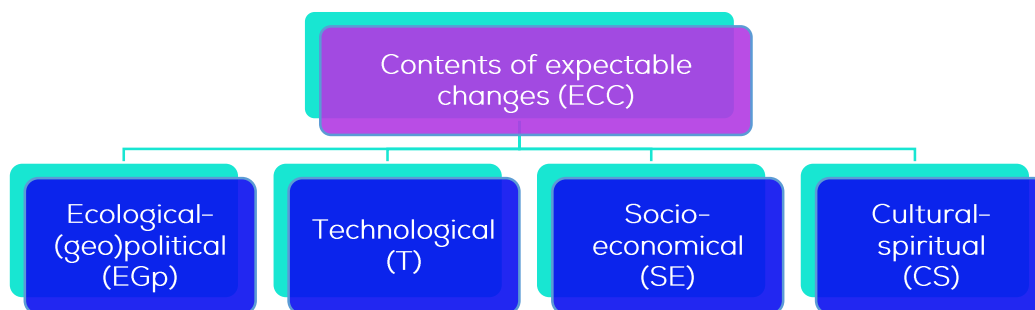


Figure 3: The contentual types of expectable change

Predictability (P) is another factor which a classification of changes can rely on. Thus, changes can be

- predictable
- and unpredictable changes.

The first type includes changes that are not expected or unexpected, while the second type contains changes which have some probability to occur. Good examples can be taken from demographical research and forecasts regarding climatic change. Projections using birth and mortality rates of the past enables us – *ceteris paribus* – to predict the size of future populations to a certain probability like ecologists can calculate possible scenarios of global warming from past trends in climatic change.

By utilising the relevant basic concepts of the standard theory of rational decisions,²⁴ if the chance of predictable change

- is 100%, the change is *certain* (C),
- if the probability is between 0% and 100%, the change is, *in a broader sense, uncertain*.²⁵

Knowing the - objective or subjective - probability of the realisation of an expectable change

- refers to a risky change (R).

However, if the scenarios of possible changes are known but there is no information available about their probability, it

- refers to an uncertain change (Uc) in a narrow sense.²⁶

Formally: $F_{SE, Bf, ECC, ECP}$, where $ECP \{C, R, Uc\}$

In the set of expectable changes relevant to social futuring has three elements with regard to predictability: there are certain (C), risky (R) and uncertain changes (Uc).

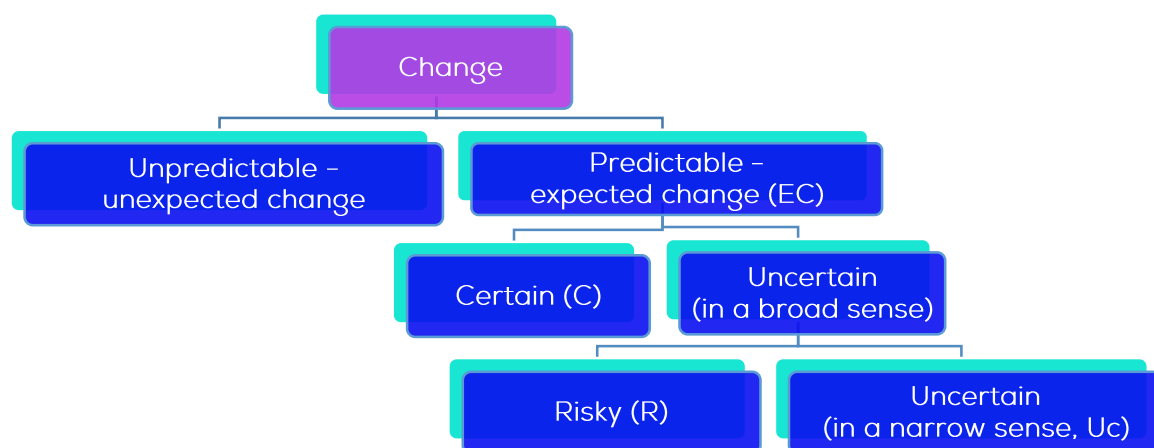


Figure 4: Types of change based on predictability

²⁴ The classic study by Luce – Raiffa (1957) was used for defining the basic categories of decision theory. See for example: Hirshleifer-Riley 1992.

²⁵ 0% probability naturally means that the change is unexpected.

²⁶ Niall Ferguson (2008) presents in detail the difference between uncertainty and risk in the context of the formation and operation of financial markets.

Within the set of expected change, based on the elapsed time period (temporally) (ECT), changes can be predicted in the

- short term (ST), or
- medium term (MT), or
- long term (LT)

which are to be regarded separately.

Formally: $F_{SE, Bf, ECC, ECP, ECT}$, where $ECT \{ST, MT, LT\}$

The set of expectable change relevant to social futuring has three elements in temporality: short-term expectable change (ST), mid-term expectable change (MT) and long-term (LT) expectable change.

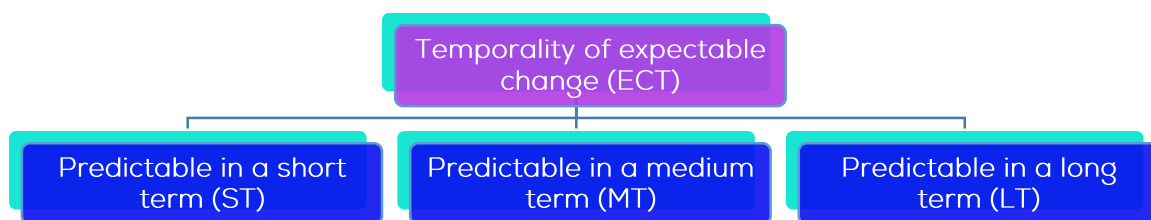


Figure 5: Types of predictable changes based on temporality

6. SUMMARY

" The behaviour of people often go through three phases when they are thinking about the impacts of future technologies: First, they worship the attested ability they offer to solve old problems; then, they are frightened by the new, serious risks of these novel technologies; and finally, they realise that the only feasible and responsible way is to carefully designate the path of development by which the benefits can be reaped and the dangers can be avoided."

Ray Kurzweil

In our study we attempted to define the concept of social futuring and classify it using multiple aspects. Having started out from the minimal definition of the notion, we elaborated on the ideal-typical definition of social futuring along the line of predefined concepts. Thereafter, classifications of the forms and types of social futuring were made according to various aspects. A complex network of concepts was set up in order to make the ambiguous notion more accurate, keeping an eye on the possibility of stepping forward in operations later, our future target being the creation of an empirically and methodologically well-founded social futuring index.

The results of creating the conceptional framework can be summarised in the following analytic formula:

$F_{SE, Bf, ECC, ECP, ECT}$, where

$SE \{O, I, Se, R, C, So, N, \dots\}$

$Bf \{Pa, A, Ra\}$

$ECC \{EGp, T, SE, CS \dots\}$

$ECP \{C, R, Uc\}$

$ECT \{ST, MT, LT\}$

That is: in the course of the conceptualisation and classification of futuring, starting out from the ideal-typical definition, we have to take the following steps:

1. we must define the social entity (entities) clearly, (i.e. organisation, institution, settlement, region, country, society, nation etc.) the futuring of which we shall examine,
2. we must decide which basic form or basic forms (proactive, active, reactive) of social futuring we are tackling with,
3. we must choose the type and number of expectable change(s) (in a contentual sense, i.e. ecological-(geo)political, technological, socio-economical, cultural-spiritual) in order to examine how the entity can prepare for them,
4. we must select the predictability (certain, uncertain, risky) of the expected change to analyse what preparations would be the most adequate,
5. we must select the temporality (short term, mid term, or long term) to best suit the preparation for an expected change.

In the light of all this, the research project ConNext 2050 - including further steps on the way to creating a social futuring index (SFI) - can be summarised with the following formula:

$F_{SE, Bf, ECC, ECP, ECT}$, where

SE {countries}
 Bf {Proactive, Active, Reactive}
 ECC {ecological-(geo)political, technological, socio-economic,
 cultural-spiritual}
 ECP {uncertain, risky}
 ECT {long-term}

We close our study in the hope that we managed to illuminate and clarify the multi-layered concept of social futuring by creating analytical notions, based on which - and on the normative foundations of the research - we may finally commence a comparative empirical research of social futuring center around a social futuring index.

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Social Futuring Center (SFC) is a multidisciplinary research unit of the Corvinus University of Budapest (CUB). Our aims are to develop the conceptual and normative framework of social futuring, to construct the **Social Futuring Index (SFI)** and to manage the **ConNext 2050** research project. The main scope of its research is the analysis and interpretation of social futuring of different social entities, focusing on short and long-term future changes (2017-2050). The SFC periodically publishes **working papers** that highlight the findings of its research. They are published to stimulate discussion and contribute to the advancement of our knowledge of multidisciplinary matters related to philosophy, sociology, psychology, bionics, informatics, economics, political science, environmental studies, futures studies, network science. SFC working papers are available online on the **www.socialfuturing.com** website.

