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HUMAN-BEING DEFINITION

(formal linguistic presentation) - new version - 2023

Abstract

In this paper   we present the description a human-being in terms of psychological and physiological structure, behaviour and relations. The tool is   the HSL-Human Specification Language which is the subset of author's OSL (Object Specification Language) [1].
This new version contains additionally definition of "self", description of detailed brain structures and brain mental functions, selected neural networks, some aspects of body internal communication including quantum ones.

Keywords

human definition, human descriptive language, psychological cluster, self, body internal communication, neural networks, quantum space, brain description

I. INTRODUCTION

HSL does not concentrate on data structure and documents but on descriptive statements
in a classical wording specification focused on the layout and behaviour of objects.

II. HSL - HUMAN SPECIFICATION LANGUAGE

HSL   is a semiformal notation for a human being structure and processes and aditionally may be a tool dedicated to professionals dealing with human resources or anyone interested in psychotechnology.   Further development of HSL toward psychology and medicine could be achieved with close collaboration with   psychologists, medical professionals, neuroscientists etc.

Human being may be treated as an "open system which maintains a constant state while the matter and energy which enter it keep changing"[5 p.11].Human plays many roles in decision taking, execution, communication etc.

Similarly to other subsets of OSL this one contains only additional phrases and keywords that do not exist in the OSL kernel. A scope of human specification may be expanded by many other interesting topics like „human thought - the physiological process of mentation" and „ bodily and facial gestures as a factor in communication" included in HUML (Human Markup Language) [17].

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1   see Appendix

<**def subject** HUMAN-BEING>
      class1[animals.mammalia.primates.homidae]
      class2[nation.ethnic-group.profession.person]
      descr-scope[biophysical,geogr,cultural,social,legal]
      kwords[life,life-space,behaviour,scope]
      life{[bio-life,mental-life,body-internal-time,mental-time,living-<u>space</u>, <u>environment</u>]
         bio-life(biochemical-processes)
         perceptual-space(senses)
         perceptual-space[sight(eyes),sounds(ears),smell(nose),taste(tonque),touch(skin),pressure,itch,
               temperature(thermoceptor), body-position(muscle_sensors),muscle-tension(muscle_sensors),
               balance(innerear),blood-acidity,pain(nociception),body-awareness(proprioception),
               blood-hormones&drugs(chemoreceptors),magnetoreceptor,time-receptor]
         mental-life(consciousness,self-consciousness,subconsciousness,intuition)
         body-internal-time-marker(cell-telomere-length)
         mental-time[2][(sequence-of-events),backward-view(recollection-of-selected-events),
               forward-view(planning,dreaming),no-time(coma,..)]}
    {[*nervous-system(CNS,ANS,PNS*]
     CNS(brain,spinal-cord) <!Central Nervous System >
     spinal-cord(cervical,thoracic,lumbar)
     ANS(entericNS,sympatheticNS,parasympatheticNS)<! Autonomous Nervous System>
     parasympatheticNS(dorsal motor nucleus,vagus,...).
     vagus-action(heart-rate rhythm, "face-heart connection", "fight or flight" behaviors,...)
     ENS(neurons(sensory,motor,inter).,,)<! Enteric Nervous System>
     PNS(ventral-horn neurons,dorsal-root ganglion neurons,...)<!Peripheral Nervous System>}.

<def ENV><!environment>
     ENV[WORLD,CONTINENT,COUNTRY,REGION,SITE]
     ENV.legal<!Legal acts, resolutions, decisions>
     ENV.cultural[tradition, history, education,religion, ideology, art, radio-tv]
     ENV.biophysical[animals.homosapiens]
     ENV.geogr[homeAddress,company/school]
</def>

<def>Person
 { object.nfo[id,sex,birth-data]
     invariables[id,sex,birth-data]
     homeaddress[country,site,street,house,flat]
  [genetic-id[fingerprints,DNA,sex-chromosomes (XX*<!females>*, XY*<! males>*),
   genotype(AA,AO,BB,BO,AB,OO),phenotype(height,eye-color,skin-color,blood-type,..)]
  [consciousness,mind,emotions,behaviour(relations,actions,...),state,life-space,..]
  mind[wisdom(thinking,reasoning,learning,recognizing,communicative-competence),
     knowledge,...)]
  complexEmotion[love,hate,satisfaction,frustration,agression,enjoyment/pleasure, anger]
  complexFeeling(fear-of-insupport,regression,inferiority,persecution)..]
  elementaryEmotion[hunger,thirst,chills,pain,..]
  relations to/with (self,family-members,environment,..)
  state[active,inactive,grounded[3],dormant,suspended,aborted,idle,lost,dead,

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2   We don't mention here the features of physical time   which is the passage of time and due to the limited speed of light sensed as
      an interval between events.
3 Lowen[5] introduced the concept of grounding that describes contact with reality and level of security. A grounded person is a
person who is able to respond to external situations in a mature and situationally appropriate manner. So groundedness is the ability
to stand on one's own feet and experience foot contact with the ground. It turns out that the intensity with which we touch the ground

homeless,retired,married/divorced/single,ignored,misused,abused,]

life-space[psychological,social,educational,professional,financial,..]
living-space(2D<!physically handicapped people>,4D,nD<!in case of schizophrenia>),....)
olh:=[birth,aging-curve,social-events,health-illness-events,
      educ-events,job-events,critical-events,death]<!object-life-history>

behaviour[marriage,friendship,career,ilness,aging,..]

psychological-cluster[self,character,attitude,leadership,ability,
      extraversion,anxiety,independence,healthState,
      lifeStyle,creativePotential,satisfaction-level,BipolarPersonality]}

body[weight,height,eyes-colour,defects]
family[gentree,parent,child,son,daughter,
      grandSon,grandDaughter,granMa,granPa]
emotion[love,hate,satisfaction,frustration,agression,enjoyment,anger]
psychComplex[fear-of-insupport,regression,inferiority,persecution]
habit,hobby,profession,
health[measures,physical-examinations,illness-history],
role[advisor,consultant,manager,patron,partner,customer,
      supervisor,participator,owner,supplier,
      user,analyst,designer,programer,operator] <!plus 'role' in kernel>   ,
appearence depends on,assisted by,belongs to,matched/matches,
relations<!plus relations in kernel>
relates to <family-members>used by,uses,not used,misused,abused,
state[active,inactive,dormant,suspended,aborted,idle,lost,dead,
      homeless,retired,married/divorced/single,ignored]
place[point, area,everywhere,nowhere]
life-space[psychological,social,educational,professional,financial]
behaviour<!flow of processes of the object >
behaviour.rational[selfrealization,need,satisfaction]
behaviour[marriage,friendship,career,ilness,aging]
genotype,fenotype
olh:=[birth,aging-curve,social_events,health_illness-events,
      educ-events,job-events,critical_events,death]<!object-life-history
</def>

<def> cluster<!GlobalFactor estimated on the base of several particular factors>
      cluster[self,profile/type,attitude,leadership,ability,
            extraversion,anxiety,independence,healthState,
            lifeStyle,creativePotential,happiness,BipolarPersonality]
      self[self-identity,self-assesment,self-sentiment,self-esteem,
            self-regard,self-reliance,self-control,
            self-image,self-extension,self-structure]
      leadership[assertive,creative,facilitative,independent,
            stable,permissive,leadership(Style,Potential]

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reflects our contact with reality. There are two types of grounding: grounding in the body and in space. Grounding in the body means that we are in contact with every part of our body, grounding in space is precisely the confidence with which we stand, walk and touch the ground.

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        ability[toughMinded/openMinded,creative,fast/slow,
                toleratesDisorder/perfectionistic,grounded/abstracted,
                improving own learning,problem solving, IQ, ......]
        need[biological(food,medical,emergency,rescue, coping),
             cultural,psychological(love,esteem,selfrealization),
             financial-resources,security]
        BipolarPersonality[Warmth,Reasoning,EmotionalStability
                            Concillation,Dominance,Liveliness,Openness,
                            Tension,Rule-Consciousness,SocialBoldness,
                            Sensitivity,Vigilance,Abstractedness,
                            Privateness,Apprehension,OpennessToChange,
                            Self-Reliance,Perfectionism]
</def>
<def self>
        { self-recognition[self-identity,self-assesment,self-sentiment,self-esteem,
             self-regard,self-reliance,self-control,self-security,self-image,self-extension,self-structure]
        self-inside[thought,perception(reality/illusion,like/dislike,efficasy,aim,..),evaluation]
    <!A self-efficacy refers to feelings of adequacy, efficiency, and competence in coping with life.>
        self-aim[rational(selfrealization,need,satisfaction,selfsecurity),regressive])
        leadership[assertive,creative,facilitative,independent,
                   stable,permissive,leadership(Style,Potential]
        ability[toughMinded/openMinded,creative,fast/slow,
                toleratesDisorder/perfectionistic,grounded/abstracted,
                improving own learning,problem solving, IQ, ......]
        need[biological(food,medical,emergency,rescue, coping),
             cultural,psychological(love,esteem,selfrealization),social(freedom,..)
             financial,security]}
    </def>


<def> BipolarPersonality
        [Warmth(reserved/warm),
         Reasoning(concrete/abstract),
         EmotionalStability(emotional/stable),
         Concillation(concillatory/aggressive),
         Dominance(deferential/dominant),
         Liveliness(serious/lively),
         Openness(extraversive/introversive),
         Tension(relaxed/tense),
         Rule-Consciousness(expedient/rule-Conscious),
         SocialBoldness(shy/socially-bold),
         Sensitivity(utilitarian/sensitive),
         Vigilance(trusting/vigilant),
         Abstractedness(grounded/abstracted),
         Privateness(forthright/private),
         Apprehension(self-assured/apprehensive),
         OpennessToChange(traditional/open-to-change),
         Self-Reliance(group-oriented/self-reliant),
         Perfectionism(tolerates disorder/perfectionistic)]
    </def>
```

<def>**BRAIN**[forebrain,midbrain,hindbrain]

      forebrain[thalamus,hypothalamus),basal-ganglia(caudate-nucleus,putamen,globus-pallidum),
            cerebral-cortex]
      midbrain[tectum,colliculus(superior,inferior),tegmentum,substantia-nigra]
      hindbrain(brainstem:reptilian-brain,cerebellum,medulla,pons)
      brain-area[cortical-region,subcortical-region,nucleus(clump/layer)]
      cortical-region[primary-visual,entorhinal,inferior-temporal,orbitofrontal,
            lateral-prefrontal,inferior-parietal,..]
      subcortical-region[thalamus,globus-patlidus,putamen,substantia-nigra,corpus-striatum,..]
      cerebral-cortex:neocortex[lobe(frontal,parietal,occipital,temporal)]
      functional-cortex-area(visual,sensory,tactile,auditory, ..)
      somatosensory-system[subsystem1(touch,pressure,pain,tickle,itch,vibration,temperature,
            proprioception,kinesthesis),subsystem2(sight,hearing,taste,smell)]
      multifunctional-cortex-area
          [limbic-system(amygdala,hippocampus,hypothalamus,septum,cingulate-gyrus)]
      A limbic system is involved in the regulation of emotion, but affective processes spread out
      also on ventromedial regions in the prefrontal cortex.

    neuron{
      [soma-nucleous(perycarion(Golgi-apparatus,tigroid,mithochondria)),membrane,cytoplasm,
      vesicle),myelin-sheath,schwann-cell,axon-startpoint,dendrite],
      #active-synapse(*<connections>*),synapse(excitatory,inhibitory)
      activity-level(input,trigger,conduction,fire-output) *<!actual function of neuron>*
      input(electrosignal,chemical-pharmacological,natural-signal(light,sound,pressure),..)]
      form(multipolar,bipolar,unipolar),creation-type(primary,new-born,»mirror[4])]}
      function-type(motor,sensory,interneuronal,..)

   brain-basic-function[mental,sensory(vision,hearing,smell,touch,...),
             motor(eye-movement,voluntary-movement, ..)]

   brain-mental-function{
    mental-basic-function(association,speech,emotion,language-comprehension,coordination,...),
    mental-complex-function[consciousness(self,..),cognitive-activity,wisdom,intuition,.].
    cognitive-activity(attention-coordinating,decision-making,movement-selection)
    mental-hidden-function(intuition,premonition,..)}
    engine[thinking,emotions,info-retrieval,memorizing,communication,...]
</def>

Internal communication

      communication-signal[(electrical,magnetic,electromagnetic & quantum (photon,..),
            chemical,natural)]
      body-internal-communication-mode[network-layer(single,multi),signal-stream(single,multi),
          quantum-stream(selected-space,total),nerv-track(single,multi),peptide-flow]

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4   "copy" from outside (during communication with another person)

  body sensors
  [sight(eyes),sounds(ears),smell(nose),taste(tonque),touch(skin),pressure,itch,
   temperature(thermoceptor), body-position(muscle_sensors),muscle-tension(muscle_sensors),
   balance(innerear),blood-acidity,pain(nociception),body-awareness(proprioception),
   hormones&drugs(chemoreceptors),magnetoreceptor,time-receptor]

   Important position in communication takes vagus because it transmits parasympathetic signals to and from the heart, lungs and digestive tract. Brain parts take participation in integration of human system; for example hypothalamus is a connector between the endocrine system and nervous system.

<u>*<def>**BN- biological-network**</u>
  {int-comm[(Σ,Θ,μT,Ω),biochemical,species-interactions,.)
  <!Σ neural network,Θ gene-network,μT cellular microtubules network, Ω peptide network)>
      biochemical(metabolic,protein,gene,..),
      species-interactions(food-web(prey,predator)),host-parasite networks),
      space-interactions(intracell,regional,multiregional,dispersed,....)
      regulatory-biomolecules(enzymes,proteins,...)…
      micro-part[neuron,synapse,receptor,unpaired-electron,neurotransmitter,glia-cell,
             <microtubule>,MAP:microtubule-associated-protein.]
     <!microtubules are in dynamic turnover state, subject to treadmilling and dynamic instability>
      quantum-stream[cellular-microtubules(photons,unpaired-electrons,…)
      quantum-actions{[cell-actions(motility,mitosis,intracellular transport,.)]}
</def>
<u>*<def>**Selected neural networks**</u>
  <! • located in , Σ neural network, Q quantum space, Ξ layer, ¥ output , Φ function>
neural-networks(corpus-callosum,visual,memory,basic-functions,retina,language,social,..)[5]
[nerve-tracts(commissural•*corpus-callosum*,association•*hemisphere*),
 projection(cortex <=> subcortical structures)]
Σ/**Q**corpus-callosum[Ξ/$\approx$left-cerebral-hemisphere <=> Ξ/$\approx$right-cerebral-hemisphere]
          <!essential for integration of cognitive and emotional functioning>
 Σvisual[Ξretina(Ξphotoreceptors,Ξ interneurons,Ξganglion-cells)
           $\equiv$> Ξthalamus(messages) $\equiv$> Ξvisual area •*occipital lobe*]
    <! puts together the color, motion, orientation, depth information to "see" the image>
Σmemory(Ξhippocampus<=>Ξparahippocampal)
Σbasic-functions(Ξmedula<=>Ξspinal-cord) *<!swallowing,heart rate,breathing>*
Σsocial(Ξmedial-prefrontal-cortex<=>Ξposterior-superior-temporal-sulcus)
Σlanguage{left-hemisphere[lobe(temporal,occipital,parietal) $\approx$convergence(auditory,visual,sensory)]
   ¥$\equiv$>(wernicke's-area,broke's-area,..) [right-hemisphere $\approx$feature-of-speech(emotional,prosodic)]}
Σmotor/muscles[6]{primary-motor-cortex[tract(dorsolateral:pyramidal,ventromedial)] $\equiv$> spinal-cord}
Σspatial-attention(posterior-parietal-cortex,frontal-eye-fields)[7]
Σface-recognition(middle-cortex,temporal-cortex)
Σself(posterior-cingulate-cortex,medial-prefrontal-cortex,inferior-posterior-lobe)[8]
ΣRAS[Ξspinal-cord(reticulospinal tracts) <=>Ξ(hypothalamus.brainstem)]
    <!RAS:Reticular Activating System- functions(autonomic,motor,sensory,behavioral,cognitive,mood-   related)>
 </def>

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5   some of widely known brain neural networks.
6   [6]
7   [7]
8   [8]

Conclusion

HSL language is a tool for short description of the human-being. One possible usage of this language is a help in creation of human resources database in a corporation or even at international scale for searching individuals who meet certain psychological, intellectual and professional requirements. Particularly it could be useful to form well collaborating task teams.
Generally, reading of this paper may be recommended to anyone interested in psychotechnology or neuroscience .

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Appendix

OSL OBJECT SPECIFICATION LANGUAGE (notation and phrases)

OSL is dedicated to present the various structures of objects, their relations and
dynamics (events, actions and processes). It was invented as a tool for free structured modelling aimed at modelling the variable structure as an opposite to the widely used "well-structured" approach usually focused on top-down hierarchical decomposition. In free approach boundaries are not finally defined, because they are never to be completed and because components may be modified at any time.
OSL is like a metalanguage - it has been built as open and flexible. It covers not only main objects (subjects) but also whole environment all around   defined globally (at kernel) and locally (at subject level) and also open objects which could be incorporated in any "place" like free electrons in atoms.

1. NOTATION

<!...>	*comment*
< >	*container*
<def > </def>	*start-end of definition*
<spec> </spec>	start-end of specification
<beg> <end>	start-end of section
:	equivalent name

=	value assignment
[..] {..}	list of assigned words
(..)	list of items
|name|	executive/operational object
	Relations
::	belongs to
⇒	mapping or multitrack relation
↔	bidirectional passive unary relation 1:1
→	forward unary passive relation - no change
<=>	complex many to many active relations
<=, =>	backward, forward active relations>
: ::	equivalent belongs to
/ &	or and
a/b/c/../x/	only one element can be used
a&/b&/c&/..	any combination can be used
,.. ,…	more , much more
UUUU.xxxx	xxxx belongs to UUUU
<!xxxxxxxxx>	comment
	Topology:
•(name)	located in object
ɘ (name)	located in cloud
»«	outside
{.[.(..).].}	nested list of items
¥	output>
	Attributes:
@	mark of special attribute,feature,property
@dark	unknown, to obtain, to discover
@ai	generated by artificial inteligence
@rq	requested
¦	optional
|±	replaceable
┤	blocked
‖	isolated
?	questionable
#	number of

2. Phrases

<!object definition>
<def subject <NAME><!main object name>
<def <name><!ordinary object/item name>
object.id<!object identifier>
object.type[eObject<!elementary atomic object >,
            dObject<!dynamic object >,
             iObject<!informational object >,

vObject<!virtual object >,
sObject<!smart object)>,
oObject<!open object>,
incObject<!incarnation of object>,
astrObject<!astral quantum object>
binObject:BINDER<!collection of integrated objects>,
copyObject<!copy of object>
problObject:PROBLEM<!task to be performed>,
interObject<object created by intersection of objects>,
capsObject:CAPSULE<!portion of information reserved for a given user>]
 interObject[(list of objects) when <condition>]
sObject[noiceReduction,selfTeach,selfRepair,selfKill,selfRestore,selfRestart]
oObject[input(parameters,data),output(info,messages),

<!dynamics definition>
event:ev<!-elementary atomic fact >
operation:op
action:ac<!sequence of operations or events>
process:pr<!sequence of actions and events>
pr[trigger,<actions><events>,endEvent]
dynamics[event,operation/transaction,action,process]
dynamics[ev,op/tr,ac,pr]<!short notation>
dynamics.scenario[evSc,opSc,acSc,prSc]<!event scenario,….>
trans<!transaction in terms of operating system monitor>
ftrans<!financial transaction>
reverseMode[rev,rAc,rOp,rTr]<!back to the previous state>
scenario:sc<!predicted sequence of actions and events>
scenario.rank[best,middle,worst]
object.Info<!information visible at the moment of access>
keywords:kwords<!additional keywords in def>
olh<!object life history>[timeline,events,aging-curve]

<!interactions-relations>
role[interface,integrator,component,monitor,commander,
     driver,trigger,reactor,agent,executor,generator
     locator,executor/performer,initiator,terminator,destructor,
     participator,owner,stockholder,customer,supplier;partner,employee]

relations[activated by,activates,assisted by,built from ,
          appearence depends on ,belongs to/is owned by ,
          exists as satellite of <object>,calls <object> (<interface>),
          consists of <parts>,contained in/contains,
          controlled by/controls,derived from,
          existence depends on,exists when/in/for,
          included in,linked to ...by/links,
          refers to,relates to,related by affinity,
          represented by/represents,involved in,
          shared by/shares,used by/uses]

state[active,inactive,dark,dormant,suspended,aborted,
      variable,invariable,idle/waiting,lost,expected,deleted,homeless]
status[generic,real,virtual,undefined]
reactor[acceptance,rejection,constructor]
rank[critical,necessary,most wanted,optional,worst,best]
rule[decision-table,when-if,formula]

</def>