

What is a *game*?

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Introduction

Article by Per Lindstrand. This article intends to provide a short but informative definition of what a *game* is and a discussion around this definition; what qualifies and not qualifies as a game as a direct consequence of the definition.

A Game

To provide a definition of what a *game* is it is important to have a *reason* to define it. This affects the definition greatly and determines the focus. I formulate my definition to provide a meaningful way of classifying activities as games and “non-games” for a game developing audience.

I argue that an activity can be classified objectively regardless of the – of course subjective – experiences of the participating parties. An uninteresting but still important subjective approach, however, is that an activity is a game if and only if the founder defined it as a game. This is not a meaningful definition but a valid one and corresponds to works of art rather than rational constructions (abstract or otherwise.)

Definition

“An unreal and informal activity where at least one participating agent can intentionally achieve one or

more (system or self defined) goals given a set of constraints and a set of actions.”

The definition focuses on the objective view of an activity rather than the experiences of the participating agents, their possible actions and defined goals.

The requirement that the activity be *unreal* means that it should not be incorporated in the environment of a participating agent. That is, the activity must not be a participating agent’s reality.

Informal suggests that the activity must not have “real” effects as a direct consequence of the nature of the activity. Although you may be injured in a game of soccer it is not a direct consequence of the game itself and should therefore not be subject to rejection as of this requirement. The activity must be an informal activity that is not, in its entirety, part of the struggle for survival of a participating agent. Otherwise it would contradict the *unreal* requirement.

A *participating agent* need not perhaps be explained in further detail in itself, but an elaboration on the categorization is important. I differentiate *agents* as *participating* and *observing*, where a *participating agent* actively control and affect subsets of the activity environment intentionally through actions.

Perhaps the most specific term in

my definition is *one or more goals* which a participating agent should be able to achieve. In this context, achieving a goal implies a method to present the an agent with qualitative feedback. The activity must therefore provide a measurement of success or failure. A goal need not be complex or large and can be defined as the result of one or more actions, defined by the activity, set of rules and environment, performed by a participating agent. The goal may well be subjective and defined by a participating agent as goals can and in some instances must be defined.

The limitations and constraints on the system – in which the activity is exercised – are defined by a set of rules and the environment. The set of rules are most likely to enforce reductions on the number of possible or inductions on the number of sequential actions a participating agent need to perform in order to achieve the goals associated with the activity. A given environment may imply further reductions and/or inductions on a participating agent’s possible and required actions.

The term *participating agent* requires the activity to be interactive in some sense. The set of actions that the system provides a participating agent defines the extent of interactivity supported.

To be or not to be

What qualifies as a game according to the definition? I will discuss two borderline (with respect to the definition) examples; one that is a game and one that is not a game.

An example of an activity not qualified to be a game is specific instances of classical *role playing games*, provided the master agent ignores the set of rules – often listen in a rule book. All participating agents’ actions must, in

all instances, be submitted to the master agent (who in this case subjectively defines the system constraints) and are therefore not proper actions if the master agent ignores the original set of rules. In this particular instance we have an activity with subjective constraints, actions and goals. It is merely a “show” without direct or indirect interaction.

There are of course numerous activities that are games according to the definition, a rather bold statement is that all competitions are games. The basic nature of a competition implies one or more participating agents that engage in an activity and through given actions produce comparable outcomes. This is, however, only true in *unreal* competitions, reality can not be a game.

The activity of playing patience or solitaire would often not be considered a game as it lacks a natural conflict, it is merely a competition against oneself. This is indeed a game as it contains at least one participating agent who can intentionally achieve a goal through application of possible actions. It contains a set of constraints instantiated from a set of rules. This implies that it is most certainly a game activity.

Bungy jumping is not a game. It has a participating agent and some environmental constraints, the goals can be considered self defined in this instance. The activity is both unreal and informal in a sense. However, it has no set of actions to enable a participating agent to achieve a goal. A bungy jumping “game”, however, can be a game (of course.) The necessary requirement is a set of actions to enable a participating agent to achieve a goal – system or self defined. Without this, it is merely a simulation of gravity in a sense.

To further stress the significance of the game activity to be *unreal* and *informal*, building bridges and a game of

building bridges are examples of games and non-games respectively. Although game immersion can interfere – to a certain extent – it can not invalidate both of the requirements at the same time. That is, an agent is always in an informal or unreal state when actively participating in a game activity.

Freedom of Expression

There are a number of people who have tried to define the (inherently vague) term *game*. I will discuss their approach and compare them to my own definition. Interpretation of their definitions without further explanation of terms used can of course be erroneous but I will try to explain my disambiguation.

“...a game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context.”

— Clark C. Abt

Depending on the definition of *decision-maker* his definition obviously excludes activities with only one participating agent. Traditionally, inanimate objects can not be decision-makers and this must not exclude an artificial intelligence if so called *single-player games* should be included. The definition describes the world, effectively, as there is no constraint on the context in which the activity is exercised. We can in fact infer that *any* activity involving two or more agents with at least one action is a game. This is not meaningful.

The decision-makers corresponds to my participating agents and his focus on them trying to achieve *their* objectives would be equivalent to my system or self defined goals. A limiting

context corresponds to my set of constraints and actions.

“[Play is] a free activity standing quite consciously outside ‘ordinary’ life as being ‘not serious’, but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings, which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means.”

— Johan Huizinga

This definition is rather complex. The activity must be “outside” the participants’ lives and it must not be “serious”. Furthermore, it is an absorbing activity for the participants. The former is an important statement and similar to “unreal” and “informal” in my definition but I find that an activity is or is not in some way “absorbing” to a participant is irrelevant.

That no profit can be gained by participating is perhaps an inherent effect from the requirement that the activity must be “outside” the participants’ lives and must not be “serious”. This also suggests no material interest which is, again, inherent. If this suggests that a football player must not profit from playing is difficult to say.

The last sentence regarding social groupings and secrecy seems to lie (pardon the pun) beyond the objective scope of the definition. It is merely and

opinion or personal generalization that narrows the defined set of activities in a more or less meaningless manner.

Roger Caillois argues that a game has the following properties

- Free
- Separate in time and space
- Uncertain
- Unproductive – creates no goods or wealth
- Governed by rules

Criteria such as “free”, “separate in time and space” and “unproductive” may well be derived from Johan Huizinga’s definition, at least they agree to a certain extent. Terms such as “governed by rules” are perhaps too general and are, in some way, either implicitly or explicitly included in almost all definitions. This follows logically from defining a system with constraints.

It is hard to infer anything from “free” and “separate in time and space” and to a lesser extent “uncertain”. Without a proper discussion regarding terms used it is, however, possible to infer a contradiction between “free” and “governed by rules”, though understandably this is probably not the case if terms are elaborated further by the author.

“A closed formal system that subjectively represents a subset of reality.”

“Interactive representation.”

“Conflict.”

“Safety.”

— Chris Crawford

This definition focus greatly on *video games* rather than games in general, it is easy to infer that *Chess* or *Poker* are not games. At least I would not

consider *Poker* to be a “subjective representation of a subset of reality” in any way. Any abstract “game” would be excluded.

The “conflict” in this case translates as “obstacles that challenge the goal pursuit.” This also, indirectly, implies a “goal” in a game. Again, this (partitioned) definition is really too vague to decipher and criticize.

“A game is a form of art in which participants, named players, make decisions in order to manage resources through game tokens in the pursuit of a goal.”

— Greg Costikyan

The definition implies some resource management through undefined game “tokens” and also that there is a goal. Greg Costikyan also states that a game is a form of art, albeit an interesting statement but it only implies that a game is a creative product. The latter of course excludes any type of play.

Art is subjective and therefore we can infer that any activity where participants make decisions in order to manage resources in pursuit of some goal is a game. This, among other activities, includes the common stock market trading, seeking employment and play music.

“Games are an exercise of voluntary control systems, in which there is a contest between powers, confined by rules in order to produce a disequilibrium outcome.”

— Elliot Avedon & Brian Sutton-Smith

This definition also focus on a special case of games where the goals of the participants creates a disequilibrium outcome, as in Chris Crawford’s definition. That is, a contest between

“powers” in the context of the activity. A voluntary control system either suggests that the activity is free or that a participant’s actions within the context of the activity is free. The focus on competition on this definition naturally excludes all non-competitive activities normally considered games. The term “outcome” also suggests that activities that has no real “end” are not games, this is indeed arguable.

“A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.”

— Salen & Zimmerman

The definition states that a game is a system in which players, participants, are involved in artificial conflict from which a quantifiable outcome emerges. As in Avedon and Sutton-Smith’s definition, there is an outcome – in this case it is quantifiable.

“A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable.”

— Jesper Juul

There are several parts to this definition. It is important to note that this definition also implies a finite activity, it must end and provide an outcome. The most interesting part of the definition is “a rule-based formal system” which suggests that a game is a complete system with constraints.

There are no requirements stating that the efforts that the player is exerting are valid. In accordance with the

definition these efforts can be ignored without any violation and we can infer that any finite rule-based formal system is a game.

“Theory of rational behavior for interactive decision problems. In a game, several agents strive to maximize their (expected) utility index by choosing particular courses of action, and each agent’s final utility payoffs depend on the profile of courses of action chosen by all agents. The interactive situation, specified by the set of participants, the possible courses of action of each agent, and the set of all possible utility payoffs, is called a game; the agents playing a game are called players.”

— John von Neumann & Oskar Morgenstern

I would consider this one of the better definitions due to the objectivity and completeness as well as the terminology. A formal, almost mathematical, approach to define “achieving goals” as “maximizing (expected) utility index”. A versatile and clear definition. Neumann and Morgenstern, quite unnecessarily, state that a sequence or course of actions are taken by the participants where the fact that a participant – perhaps per definition – can take an action at some point in time is enough.

A distinct difference to my definition is that Neumann and Morgenstern has – consciously or unconsciously – no definition of the term “in a game”. I refer to the concept of “in a game” as being unreal and informal, this ensures that no activity that is real or serious can be classified as a game.

Fullerton, Swain and Hoffman defines a game, in the book *Game Design Workshop*, as

- A closed formal system
- Engages players in structured conflict
- Resolves in an unequal outcome

This definition, possibly inspired by previous attempts to define games as a finite activity, contains a reference to disequilibrium or unequal outcome. I find that this excludes too many computer games without a finite state. A requirement of conflict – although depending on the usage resolution and scope in many cases – is simply not true for some activities that are naturally games. A conflict implies two parties, that is, an activity must support two participants in order to be a game, this is not a meaningful requirement.

Finally, the Webster’s Revised Unabridged Dictionary defines *game* as

“A contest, physical or mental, according to certain rules, for amusement, recreation, or for winning a stake.”

— Webster’s Revised Unabridged Dictionary

I would say that this corresponds greatly to my own definition, albeit more readable.

Act or Actor?

The first issue I want to address in this article is the basically two classes of game definitions. A sort of psychological and technical antagonism seems to predominate the two viewpoints which I classify as subjective and objective with respect to the process of exercising a game activity.

The psychological aspect tends to focus on the playing agent, informally *player*, perspective which immediately implies a subjective definition.

An actor who participates in an activity and regards it as a game, in some sense, and therefore defines the activity as a game. This subjective approach, when applied formally, automatically leads to an unstable and – from a game designers view – unresolvable situation where the state of a classification of an activity varies with the views of each participating (and observing) agent. Albeit useful and nonetheless meaningful from a psychological perspective when examining an individual, this angle is fluctuating and imprecise concerning a group of participating and/or observing agents.

With a subjective definition any activity can be regarded as a game, with more or less limitations. A more formal and objective approach must be employed to achieve a meaningful definition.

A good Game

As Mihaly Csikszentmihalyi wrote, in the book *Flow: The Psychology of Optimal Experience*, that people, more or less regardless of social class, are the most content when confronted with a hard but achievable goal. An activity such as a traditional avocation or a game would include and imply more than adequate such goals that can be achieved.

Different types of games requires different skills and especially conceptually diverse games, often categorized into genres, target audiences of agents with distinct qualities and abilities. Each game, according to the definition, implies one or more goals which are achieved through a sequence of actions provided by the system. Actions often target certain abilities and skills of the agent exercising the activity and may or may not be deemed *achievable* within the constraints of the activity. Hence the goals are not *achievable* for

the agent.

What about this?

Is football a game? Yes. It is an unreal and informal activity as it is not part of any of the participating agents' reality. At least one participating agent can intentionally achieve one or more – in this case system defined – goals (literally actually.) There are a clear set of constraints through a rule system and actions are defined by the rule system and the participating agents' physical abilities.

Is sūdoku a game? Yes. It is an unreal and informal activity as it is most certainly not part of any of the participating agents' reality. At least one participating agent can intentionally achieve one or more goals. It has a set of constraints through simple rules and these can reduce the number of possible actions for the participating agents.

Is any form of gambling a game?

Yes. The activity of gambling as a system of risks and chances for one

or more participating agents is most certainly a game. The participating agents can, through a set of actions and constraints, achieve one or more system (or self) defined goals.

I have simplified the question intentionally because I focus on the objective activity of gambling, that is, manipulating or affecting a system of risks and chances. A game of pure chance might suggest that no actions can be performed by a participating agent which implies that no game activity occurs. No system can in itself be a game, hence no activity can. We can infer that an activity without a participating agent can not be a game in itself.

Is a game really played if two programs met each other in Chess?

Yes. The activity of Chess is unchanged, the two programs are two participating agents. Chess is an unreal and informal activity where at least one participating agent can intentionally achieve one or more system defined goals. There are a set of constraints inherent from a set rule system and there are a set of actions inherent from the rule system.