



GÖTEBORGS UNIVERSITET

STUDENT

0021-EGH

TENTAMEN

TIA301 TIA315 Tentamen

Kurskod	TIA301, TIA315
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Bedömningsfrist	--
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i HT24: Welcome to examination!

This examination consists of open questions, sometimes referred to as 'essay questions'. It includes **7 questions**, each rewarded with a maximum of 3 points. The examination is limited to **2 hours**. To pass it you need **13 points** (60%)

The grading will focus on the overall capability to explain and apply ideas. It will assess whether (1) answers are logically coherent, whether (2) they are grounded in readings, lectures, and discussions, and, when applicable, that (3) answers engage the key concepts of the course.

Advice:

Please, read the questions carefully! Each question normally consists of multiple requests, such as: "**Define**... and **explain**... **illustrate** ... with an example..."

If you feel unsure about how to respond or don't remember exactly what papers or lectures said, trust your instincts and stay focused on the question. Explain in your own words, to the best of your abilities. Do not start to broadly talk about related things, to show you know other things.

It could be worth noting that longer answers are not necessarily better answers, since long texts increase the risk of ending up with inconsistencies.

1 HT24 Question 1

During an after-work gathering filled with intellectual discussions, one of your friends expresses skepticism about the idea that artifacts and technologies can have **agency**. They argue that only humans can have agency because they have consciousness and intentionality.

Explain to your friend how we can understand and assign agency to artifacts and technologies, without involving intention or free will. Use your own examples to support your explanation.

Skriv in ditt svar här

Agency can be defined as capacity to act and initiate change. For a long time, agency was attributed to humans. However, with the rise of technology and innovation, more and more materials started to have agency.

In this discussion, I would explain my friend the **Actor Network Theory** (ANT). ANT refers to the concept of "**generalized symmetry**" which basically means that both humans and materials have agency and should be considered **equal**. Both of them have the capacity to act and influence one another in the socio-technical world. The way we assign agency to artifacts are through "**affordances**". They make it possible for us to understand the effects of artifacts in our life (considering they are intangible).

Take a workshop for example: mechanics (humans) in the workshop do have agency as they create new things and influence. The same workshop might have a 3-D printer (an inhuman object). The introduction of this 3D printer "changes" the dynamics the mechanic works and exists in the workshop. Maybe they will no longer be needed or have to focus on other aspects of the work since 3D printer "affords" them to design and influence the smallest details. This is a good example how material have agency.

There is this **intricate dance** between individual and material/digital technology. They coexist and both influence one another. Another example would be the use of Social Media. in the Arab Spring, the use of Social Media affected the lives of many and allowed for changes (such as organizing protests etc) that wouldn't be possible (or as easy) with traditional methods.

Digital technologies are also programmable, meaning we can give it a purpose, a task to carry out for us as an "**operant**" resource. Take a smart thermostat for example; according to our instructions, it can turn on/shut off heating and regulate the temperature automatically, therefore initiate change.

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Besvarad.

2 HT24 Question 2

Lena and Mark are discussing the concept of **affordances**, in the context of design. Lena argues that affordances are just about 'look and feel'. Mark disagrees and insists that affordances are about more than just aesthetics; they are intrinsic properties of artifacts that guide user interaction. Help Mark explain his point of view by defining the concept of affordances. Use your own words. Then, discuss how affordances are useful in the design of digital technology.

Skriv in ditt svar här

I believe Mark is right! Affordances allow us to assess the effects of intangible objects in our lives. They focus more on our connection/relation with the artifact, i.e. the way we use/experience it, instead of its physical attributes. One could also argue that since affordances are relational, they can change over time with our interaction of the object. Take a hammer as an example for example. It can be used to build things, or destroy things.

Through the use of affordances, designers can create a better user experience and design tools that are better suited for our needs. Affordances are great help for designers to create and put meaning into new things. A chair for example is sitting because of its shape. We can use it to sit on it, or not, but it is still a chair. A UX designer might use a "play button" on a DVD player, because we attribute that particular button with "playing the audio". It creates a commonality for the user, therefore ease.

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Besvarad.

3 HT24 Question 3

We have argued that generative processes are **emergent**. Describe the characteristics of an emergent process and provide an example to illustrate how such a process has influenced the development or evolution of a specific digital technology.

Skriv in ditt svar här

The emergence refers to the "**unfinished**" aspect of a process. It is an adaptive process. Digital technology is emergent thanks to "**von Neumann architecture**". von Neuman architecture affords "**re-programmability**" and **re-producability**".

This in essence creates the emergent nature of the digital technology as it has not finished yet! This in turn makes emergence, recombination and reframing possible. With the use of "**feedback loops**", the developers can change the product's functions, give it new affordances and meanings. We can recombine different technologies to generate new solutions.

Tesla cars are a good examples of an emergent process. When a Tesla lefts the belts, it has certain features. But with "over-the-air" updates, Tesla can give the car new functions that wasn't even invented before the car left the belt. This way, Tesla can optimize its techonolgy, make it better, all while listening to its user base and providing what they want in the future. Moreover, they create an aftermarket and new incentives to innovate. This also makes Tesla put process first over products and create value for themselves and the customer.

This becomes even more apparent in digital technologies and platforms such as Google. Google now can provide us with a lot more options/functions then it could before. They can do this with the help of 3rd party developers and the emergent nature of digital technology.

Generativity allows us diversity, malleability, scalability and transparency.

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Besvarad.

4 HT24 Question 4

Jonathan Zittrain identifies four key elements that characterize **generative technology**. Introduce these four elements and explain how each of them contributes generativity.

Skriv in ditt svar här

The four aspects are:

1. **Capacity for leverage:** this refers to the usage of the technology. The more purposes a technology can be used for, the more generative it is as it expands its user base.
2. **Adaptability:** this refers to the ability of the technology to be customizable and fit the user's need. The more adaptive the technology, the more generative it is as it can be used by many diverse users.
3. **The ease of mastery:** this refers to; how easy it is to understand and learn the technology. Does it require a long education etc. The easier it is to learn, the more generative it is, as it lowers the barrier-of-entry for diverse users.
4. **Accessibility:** this is quite self explanatory. Is the technology easily accessible. Can we put our hands on easily.

A great example of a generative technology is a smart phone:

- They have the **capacity to leverage** as they can be used for more than one purpose. They can be used for communication, for entertainment, for education, for financial transfer, for work etc.
- They are **adaptable** as we can modify them to our needs via different apps and configurations. We can make it so that it fits to our purpose and goals.
- They are **easy to master** as they can be used and learned to be used easily by many people. They have similarities to all other phones, meaning, all phones have buttons/screen that is used to navigate, we put numbers in to call someone etc. Anyone who used a phone before can be accustomed to use a different one relatively easily.
- They are **accessible** as they are relatively cheap. Most people can easily get a smart phone nowadays because of mass production. They don't have to get a super advanced phone, but just a basic one with Android for example. They can also get it second hand. The technological developments made it super easy to scale the phones.

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Besvarad.

5 HT24 Question 5

In the course, we have relied on Star and Griesemer's work, when discussing **boundary objects**. This paper describes a boundary object as plastic, yet robust.

Explain what Star and Griesemer mean when they describe boundary objects as both plastic and robust. Then, use the example of a whiteboard in a collaborative workspace to illustrate how a boundary object can have both of these characteristics.

Skriv in ditt svar här

Boundary objects can be defined as the "**bridges**" between different social worlds. They allow us to collaborate and innovate with our differences in a network structure while maintaining heterogeneity.

- **Plasticity** refers to the object's flexibility, that is, how flexible it is to fit into different situations. How accommodating it is for different backgrounds, does it make it available for everyone to contribute etc.
- **Robustness** refers to the common identity of the object as it should have a structure across the platform/object.

It is an intricate balance to design a boundary object. It should be flexible enough to accommodate many and allow them to innovate, yet robust enough to maintain a common identity.

Lets take the example of a **digital whiteboard**. This boundary object is very flexible that; we can add sections/headings/tasks/tools to the whiteboard to accommodate different people, i.e researchers, developers, business people, different users. We can tweak this whiteboard according to our needs and make it fit to our purposes. We can use it for a variety of tasks, be it research, innovation, project management. Yet it still has a certain identity, a structure. We cannot actually go into its core and change its functionality. No matter how many changes we make, it is still a whiteboard. We still know how to add a new task, how to allocate, how to delete something because it has a common language, layout and design.

By providing flexibility in a structured way (maybe through standardization and documentation), a boundary object can have both flexibility and robustness.

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Besvarad.

6 HT24 Question 6

Imagine you are a product manager at a tech company that is developing **boundary resources** for a new software platform. Your company is considering two alternative strategies to enhance innovation and build market presence: **access openness** and **resource openness**.

1. Use your own words to distinguish between access openness and resource openness.
2. Briefly, discuss how each strategy could impact your company's innovation capabilities and revenue streams.

Skriv in ditt svar här

Access opennes make it available to give developers access to your platform. They can use your data to innovate and finetune their services.

Resource openness refers to giving resources to developers to make them innovate.

Lets take the example of the **CourseGuru** to explain the difference. When we have the ability to use the Guru through Canvas, we have access openness. We can use it, ask questions to it, take advantage of it, but we cannot change it, modify it and don't exactly know what is under the hood.

If we take the Guru's code and share it on GitHub, then we make it available for others to take the code, change it/fork it/modify it. In other words, we give away the resource. Then we have resource openness.

Both have advantages and disadvantages. Access opennes is a great way to innovate and increase one's userbase without upcoming costs and security concerns. They can gain a fast traction with access opennes as many developers will likely use their services, such as through an API.

While for resource openness, one has to open up their knowledge base, their company, their code to the developers and provide them with the things they need to innovate. Although this can be benefical for some companies, it is costly and has some inherent risks such as security, intellectual property etc. Research also shows that access openness is more profitable.

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Besvarad.

7 HT24 Question 7

Alice and John are having a debate about the role of digital technologies in the context of ***digital innovation***. John argues that digital technologies are tools that merely reflect and support the physical world. Alice, on the other hand, believes that digital technologies are now shaping and defining reality itself.

Intervene in their debate by introducing and explaining the concept of ***ontological reversal***. Use it to provide an argument that supports Alice's position.

Skriv in ditt svar här

Ontological reversal simply means "**digital first**". It refers to the idea that digital nowadays become the original, while in the past it was a "copy", a "reference" to the physical.

A good example to explain is a plane ticket. 10-15 years ago when we buy a plane ticket, we would have a physical ticket in our hands first that we can touch and feel. Nowadays, we only get a digital version and have to go the extra mile to print it out, i.e. digital is the original form. Same thing can be said about money. In Sweden, we mainly use digital payments and don't keep any cash. We all agree on the meaning of the money and trust the system that it will protect its worth.

This is not only changing our lives, but also the businesses around us. Online gaming has become one of the most profitable businesses in the world and many people spend more time in their "digital" world than they do in their real life. Following that, a lot of emphasis/investment has been put into AR/VR technology. Companies like Meta are creating "digital worlds" and avatars. This has become a new value stream as it extends the business into digital sphere. One can buy things for their essentially non-existent "avatars", such as gadgets, clothes etc.

Another example is Kodak. With the emergence of digital cameras, Kodak has lost most of its market share as physical photography was no longer the norm, as it was time consuming and expensive to produce the photos. Digital however gives us the ability to easily share and edit our photos, copy them, send them, change them.

Therefore, I would say to Alice that digital technologies not only support our world, but it changes/affects it. It has come to a point now that we give agency/power to the digital technologies to do things for us and we have to consider its effects on our lives.

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Besvarad.