

Conceitos base

Interface Pessoa-Máquina - 25/26 - LEI / UM

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Com o que interagimos?

- Ubiquidade de objetos,
quantos deles “máquinas”?



Figure 1: All objects touched by Alberto Frigo in January 2004, 2009 and 2014. Every line shows the images of the touched objects for one day. Please use the magnifying functionality of your PDF reader to take a closer look at the photos.

Runge, Nina, et al. "You can touch this: Eleven years and 258218 images of objects." *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. 2016.

You Can Touch This: Eleven Years and 258218 Images of Objects

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Abstract
Touch has become a central input modality for a wide variety of interactive devices, most of our mobile devices are operated using touch. In addition to interacting with digital artifacts, people touch and interact with many other objects in their daily lives. We provide a unique photo dataset containing all touched objects over the last 11 years. All photos were contributed by Alberto Frigo, who was involved early on in the “Quantified Self” movement. He takes photos of every object he touches with his dominant hand. We analyzed the 258,218 images with respect to the types objects, their distribution, and related activities.

Author Keywords
Touch Interaction; Tangible Interaction; Life Logging; Quantified Self

ACM Classification Keywords
H.5.2. [User Interfaces]: Haptic I/O

Introduction & Context
Touch interaction is heavily studied in the area of human-computer interaction (HCI). From research in the area of tangible computing [8, 10] to research enriching touch as an input modality [3, 20], the topic has gained growing importance in the field. In addition to using touch to interact with the digital world, like a computer mouse or a smartphone,

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ACM 978-1-4503-4082-3/16/05 ...\$15.00
DOI: <http://dx.doi.org/10.1145/2851581.2892575>

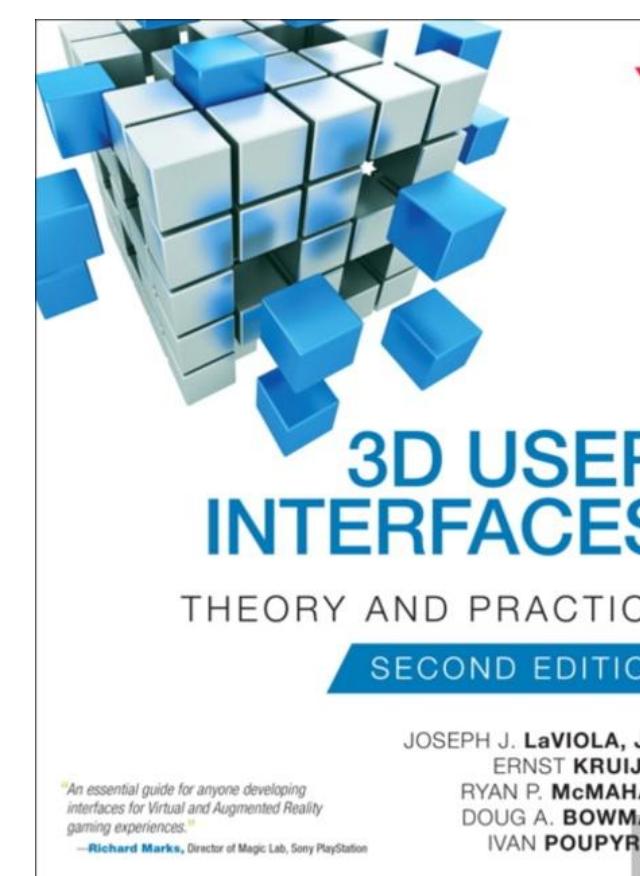
Human-Computer Interaction (HCI)

- História breve:
 - 1960s-1970s: interfaces baseadas em linha de comando – pouco intuitivas
 - 1980s: primeiras interfaces gráficas – mais visuais e fáceis de compreender
 - 1990s-2000s: uso massificado de desktops + expansão interacção por toque – interfaces mais naturais(?)
 - 2010s-2020s: uso massificado de telemóveis de nova geração + expansão para voz e gestos – utilização sem mão e multimodal
 - Tendências atuais: 3D? realidade virtual?



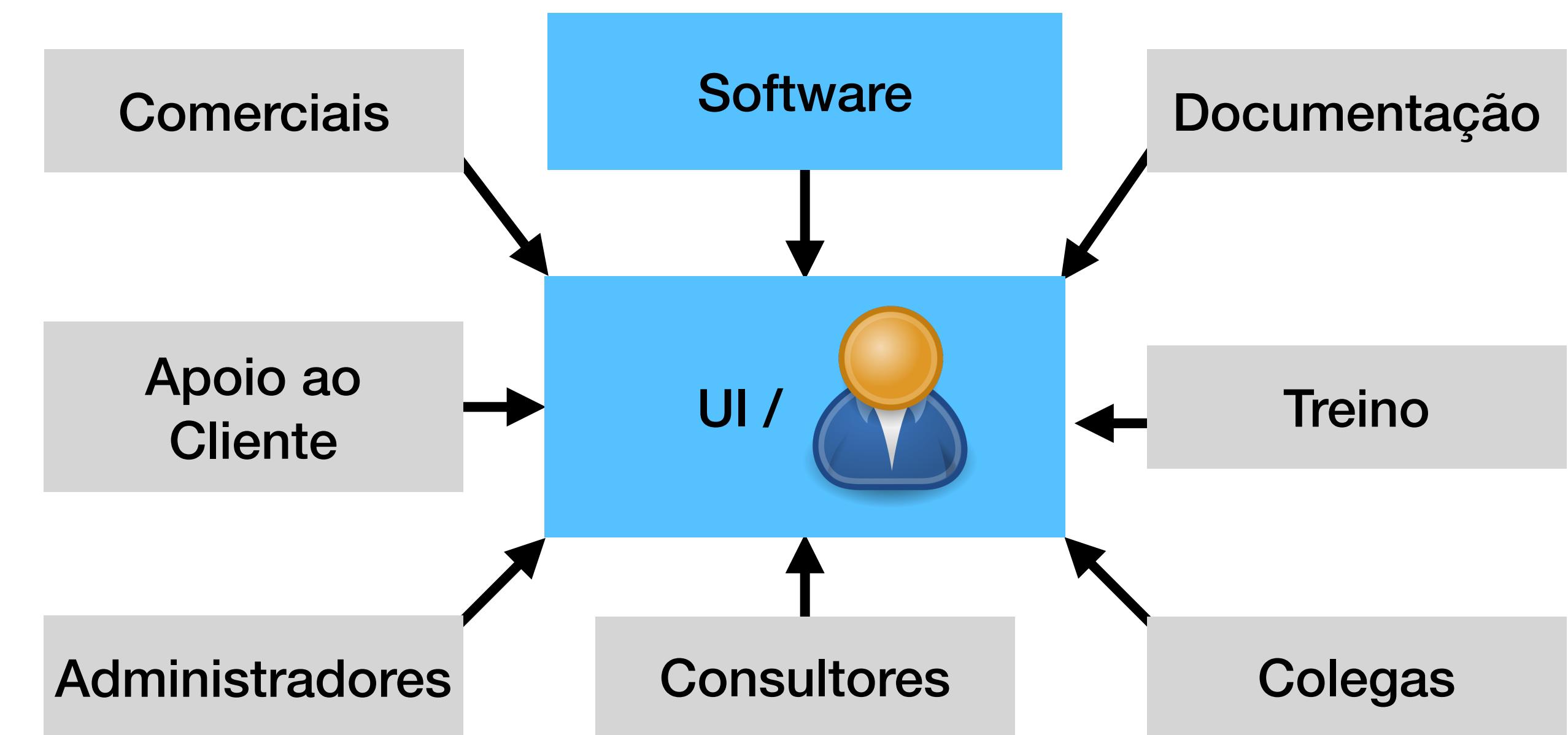
Human-Computer Interaction (HCI)

- **Interface** = fronteira entre o humano e o computador
- “the space where interactions between humans and machines occur” (Wikipedia)
- “the medium through which the communication between users and computers takes place” (LaViola Jr et al., 2017)



Human-Computer Interaction (HCI)

- Interface **centrada no utilizador**
- “the part of the system that you see, hear and feel” (Lauesen, 2005)
- “may center on the software controlled dialogue, but it also includes any documentation and training that are part of using the computer. It includes colleagues, consultants, system administrators, customer support, and field service representatives, when they are available” (Gudrin, 1993)

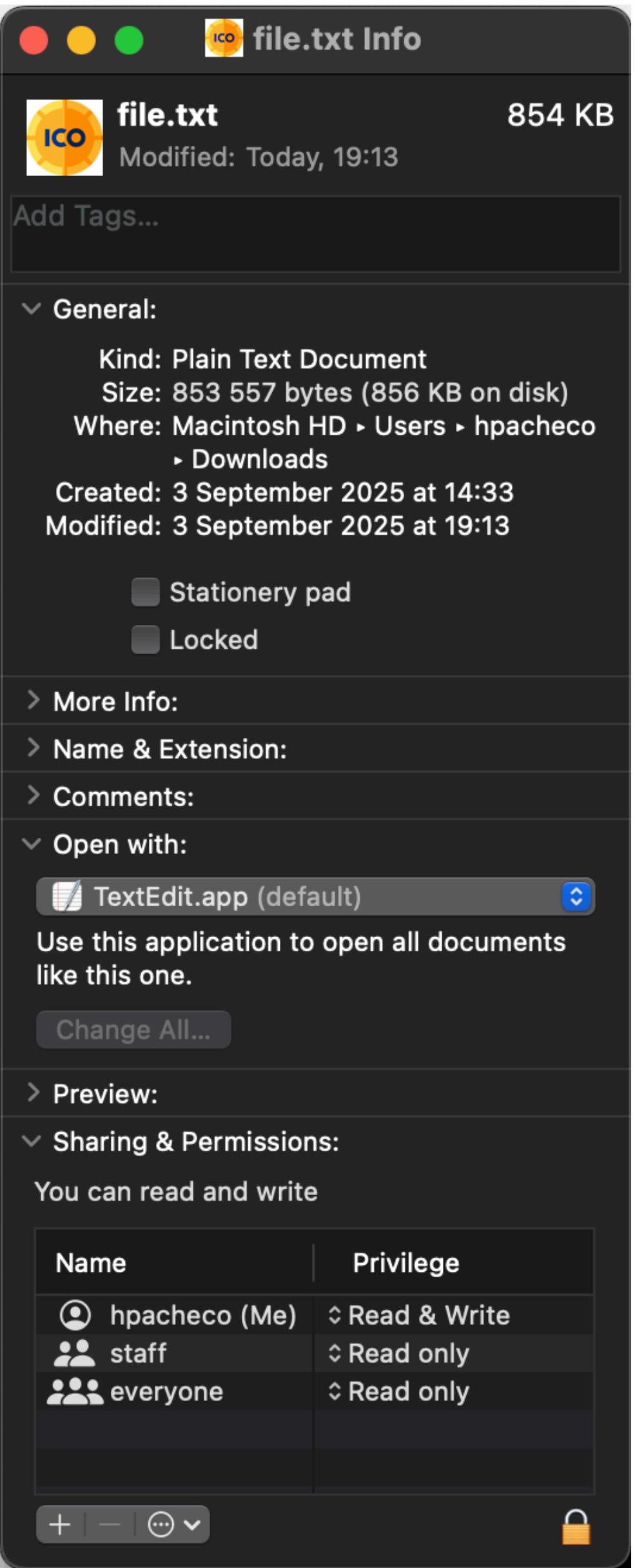


Lauesen, Soren. *User interface design: a software engineering perspective*. Pearson Education, 2005.

Grudin, Jonathan. "Interface: An evolving concept." *Communications of the ACM* 36.4 (1993): 110-119.

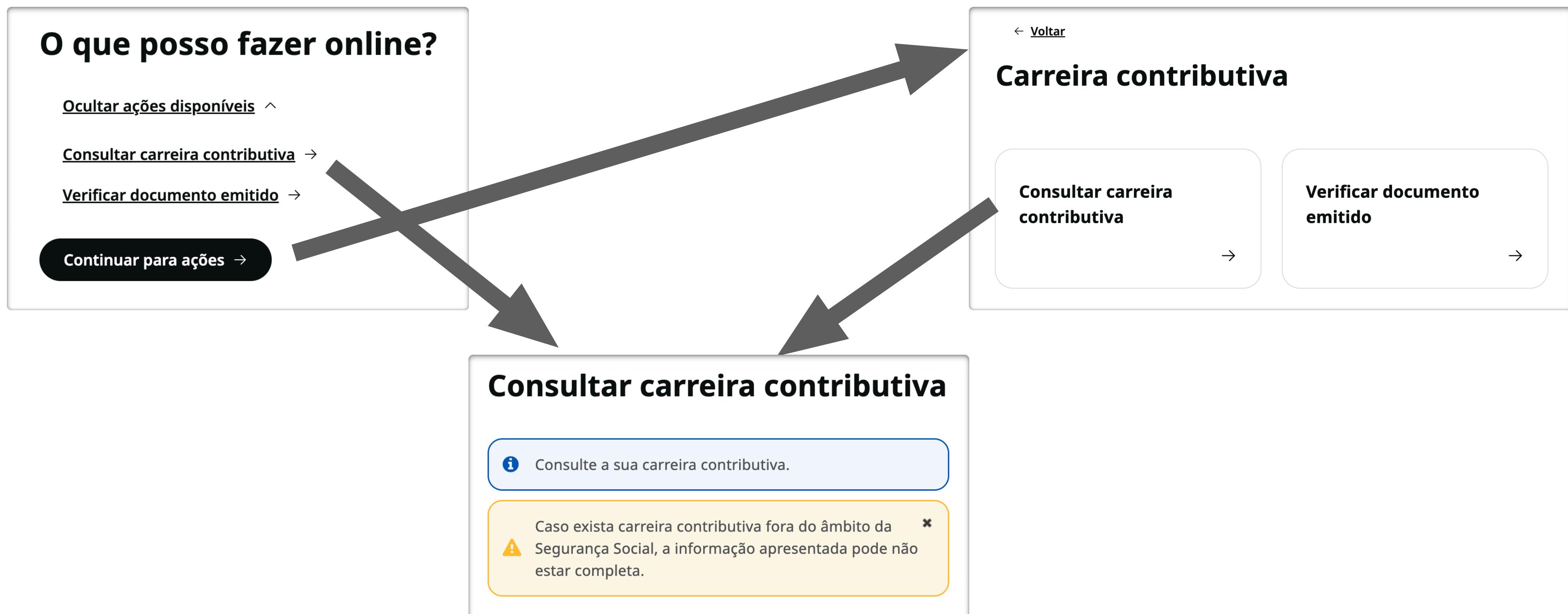
Human-Computer Interaction (HCI)

- Interface = **ações** disponíveis para o utilizador
- “the way you accomplish tasks with a product – what you do and how it responds”
(Raskin, 2000)
- E.g., em Mac, como mudar o ícone de um ficheiro?



Só as ações?

- Novo site da  SEGURANÇA SOCIAL
DIRETA
- Integração entre o atual Portal Informativo e a antiga Segurança Social Direta



r/literaciafinanceira • 1 mo. ago
fabcpinho

Site da Segurança Social mudou para pior

Dúvida

É impressão minha ou o site da segurança social passou de bastante bom para muito mau?

Vocês conseguem fazer alguma coisa lá? Antigamente era tao fácil consultar quase toda a informação e agora parece que cada botão em que carregamos vai para uma wiki sobre o tema, em vez de nos levar ao assunto em questão.

Sou o único a achar isto?

↑ 96 ↓

0 48



Share

User eXperience (UX)

- A soma dos **efeitos** (sentimentos e percepções) **causados** quando uma pessoa utiliza uma solução digital
 - inclui **não só as interacções directas** com o produto, mas também a forma como este se enquadra no processo global de realização de tarefas dos utilizadores
 - **todos os pontos de contacto** entre utilizador e fornecedor do serviço estão incluídos na experiência total do utilizador (independentemente de estarem, ou não, sob o controlo direto do produto)
 - inclui aspectos como a **usabilidade**, a funcionalidade, a estética, a acessibilidade e a relevância

create a user
experience

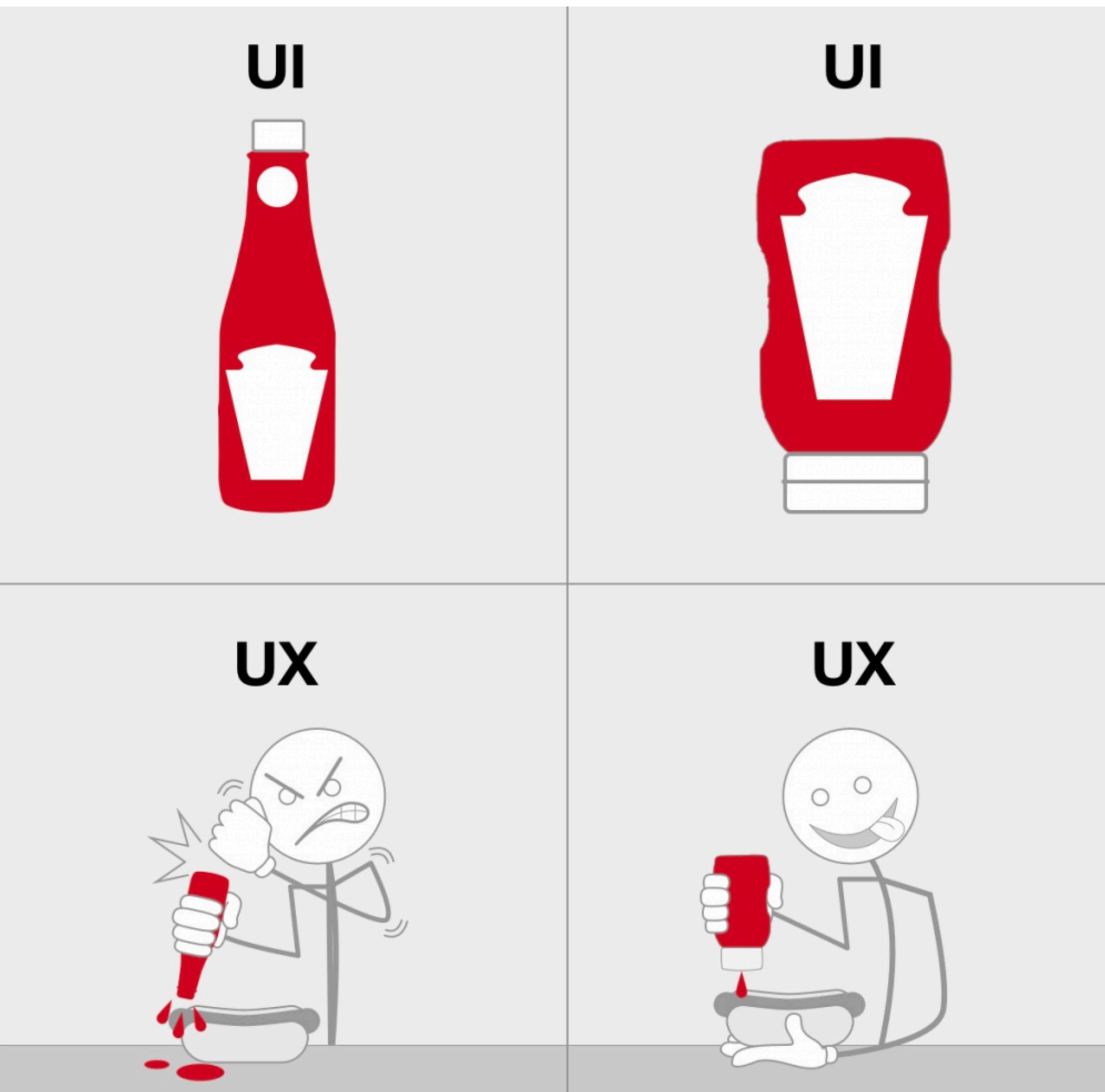
“One cannot not communicate”
Paul Watzlawick



Conceitos relacionados

- **Utility**
 - Propósito para o qual um produto pode ser utilizado
- **Usability**
 - Quão bem o produto suporta o propósito?
- **Likeability**
 - Pode estar relacionado com utility e usability mas não necessariamente... pessoas podem ser complicadas (e.g. valores morais?)

UI vs UX?



Usability

- “Extent to which a system, product or service can be used by **specified users** to achieve **specified goals** with effectiveness, efficiency and satisfaction in a **specified context of use**” (ISO 9241-11:2018)
 - **effectiveness** - accuracy and completeness with which **users** achieve specified **goals**
 - **efficiency** - resources used in relation to the results achieved (time, human effort, cost, materials, etc)
 - **satisfaction** - extent to which the user's physical, cognitive and emotional responses that result from the use of a system, product or service meet the user's needs and expectations

Ergonomics of human-system interaction

Part 11: Usability: Definitions and concepts



Martin LeBlanc ✅ F

@martinleblanc

...

A user interface is like a joke. If you have to explain it, it's not that good.

6:56 PM · May 14, 2014

63

2.3K

2.1K

54



“Usability is not a quality that can be added later to a design, it's a fundamental characteristic that is either present or not”

Steve Krug



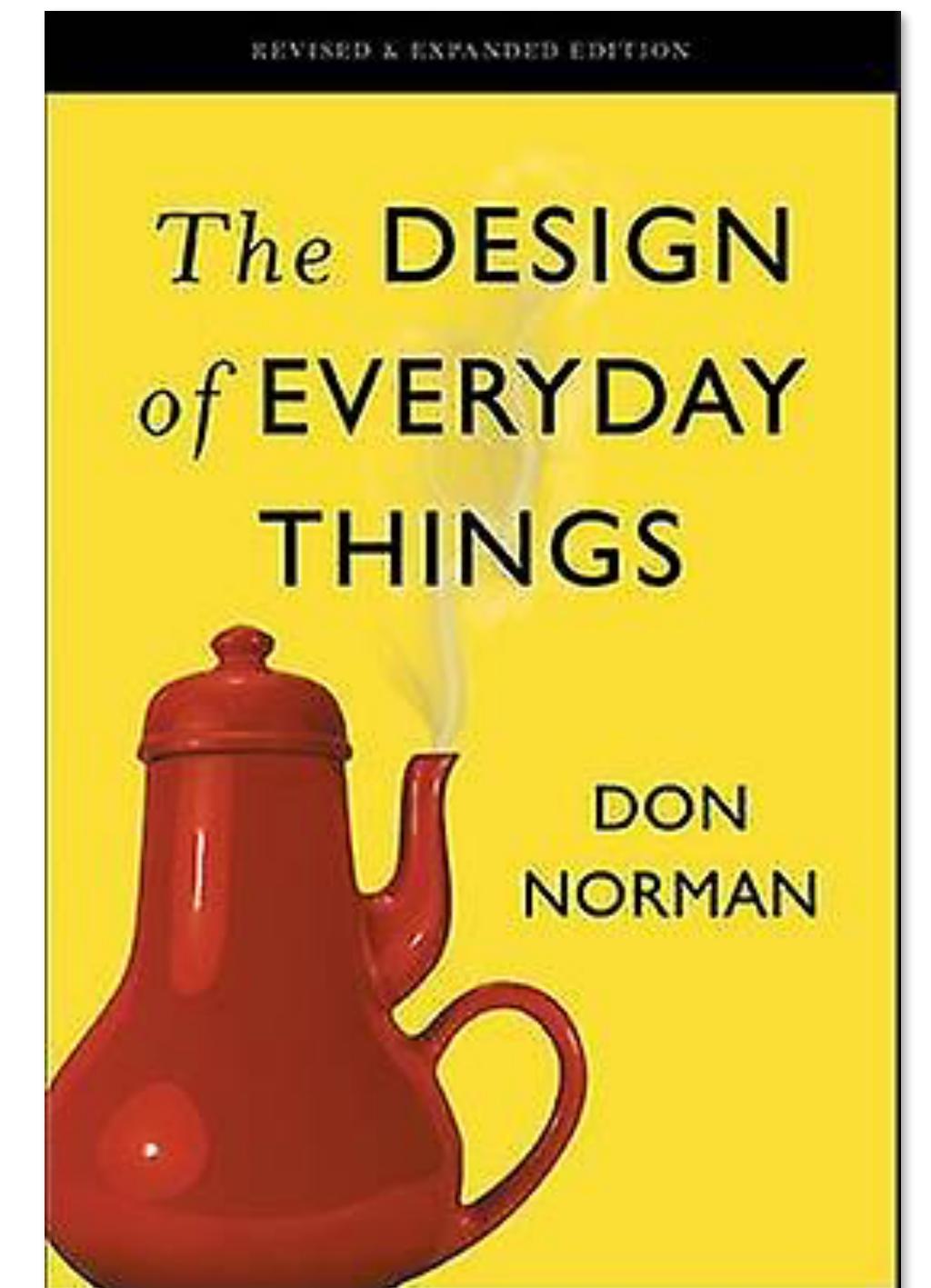
Affordances

- Affordance = possibilidade de ação entre o utilizador e o objeto
- Perceived affordance = quando, olhando para o objeto, o utilizador sabe como o usar (encontra a affordance)

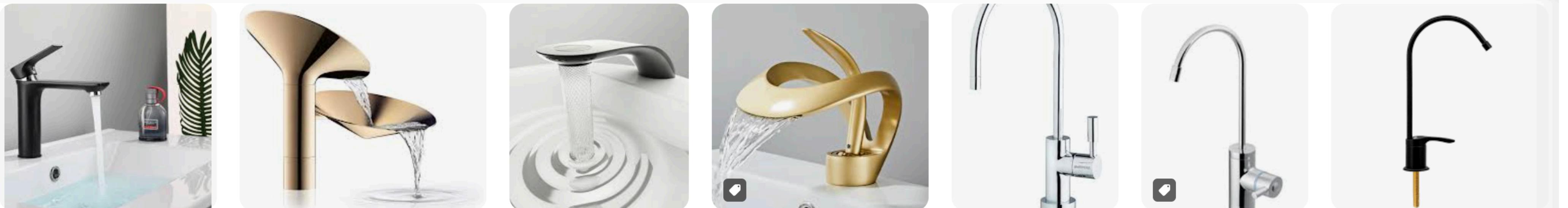
THE ORIGIN OF THE CONCEPT OF AFFORDANCES

The Gestalt psychologists recognized that the meaning or value of a thing seems to be perceived just as immediately as its color. The value is clear on the face of it, as we say, and thus it has a *physiognomic* quality in the way that the emotions of a man appear *on his face*. To quote from the *Principles of Gestalt Psychology* (Koffka, 1935): “Each things says what it is . . . a fruit says ‘Eat me’; water says ‘Drink me’; thunder says ‘Fear me’; and woman says ‘Love me’ [p. 7].” These values are a vivid and essential feature of the experience itself. Koffka did not believe that a meaning of this sort could be explained as a pale context of memory images or an unconscious set of response tendencies. The postbox “invites” the mailing of a letter, the handle “wants to be grasped,” and things “tell us what to do with them [p. 353].” Hence they had what Koffka called “demand character.”

“What the designer cares about is whether the user perceives that some action is possible”



Perceived affordances?



Hangzhou Spremium Bathr...
Modern Design Bathroom...

ArchiExpo e-Magazine
Let It Flow: Faucet Designs in...

Science Alert
This Tap Saves Wat...

Amazon.com
Waterfall Bathroom Fauc...

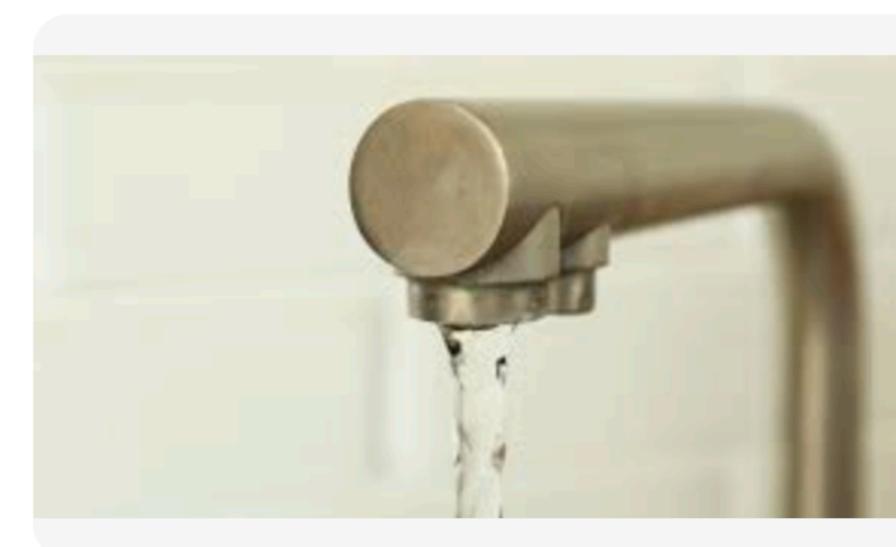
Pentair
Everpure Designer...

Amazon.com
Designer Water Fil...

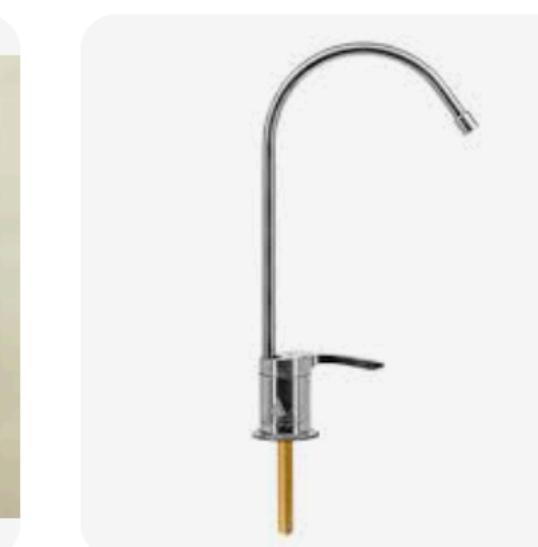
Multipure
Designer Faucet - Matte ...



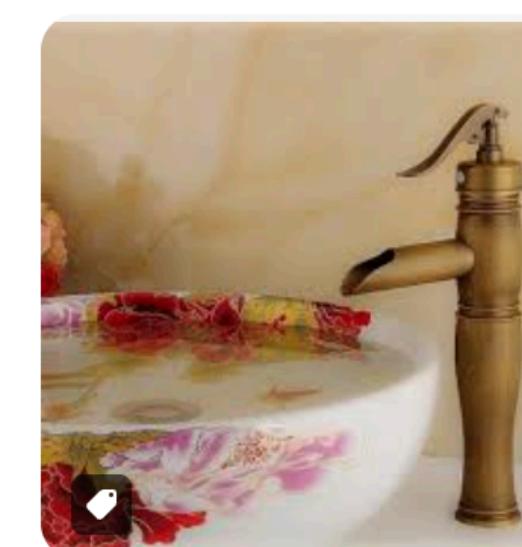
Pq Design Group
Water faucet design | Hi tech tap ...



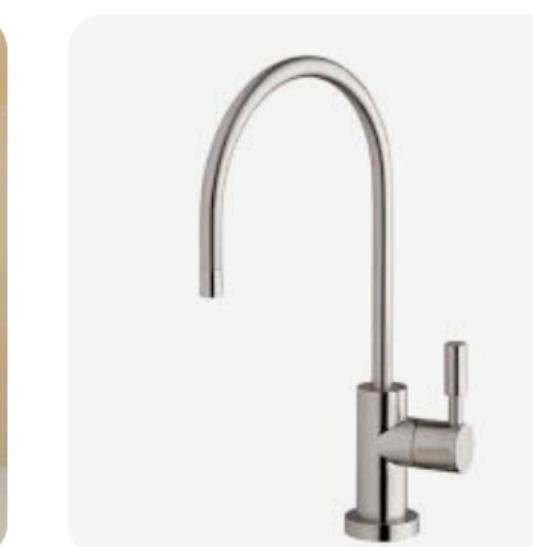
Tapron
The Evolution of Tap Design | Tapron UK



Multipure
Designer Faucet - Brush...



Zap Bath Fittings · In stock
Basin Bathroom Faucet...



Pentair
Everpure Designer Seri...



HomeRises
Designer Bathroom Fau...



ManoMano



Amazon.com



Goldenwarm



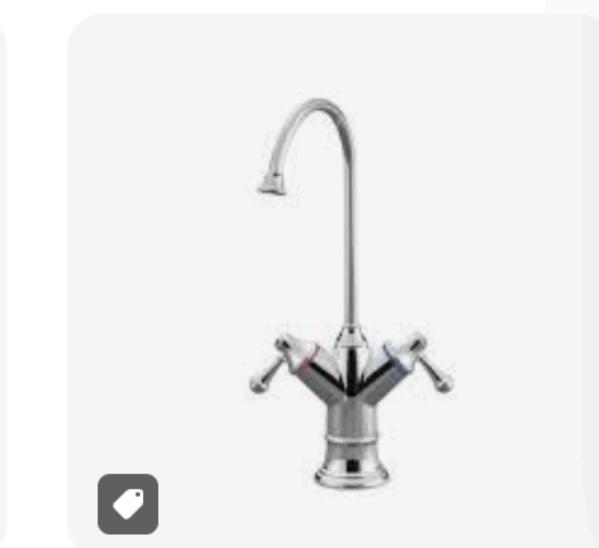
Goldenwarm



WaterWorld Magazi...



Aquasure USA



Aquatell · In stock

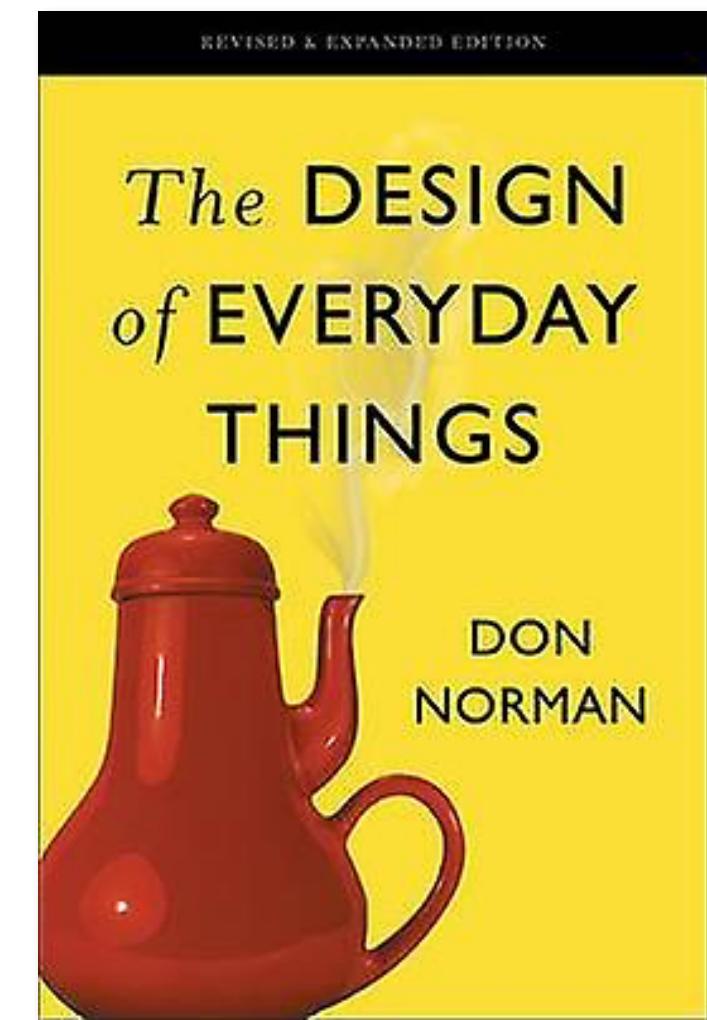
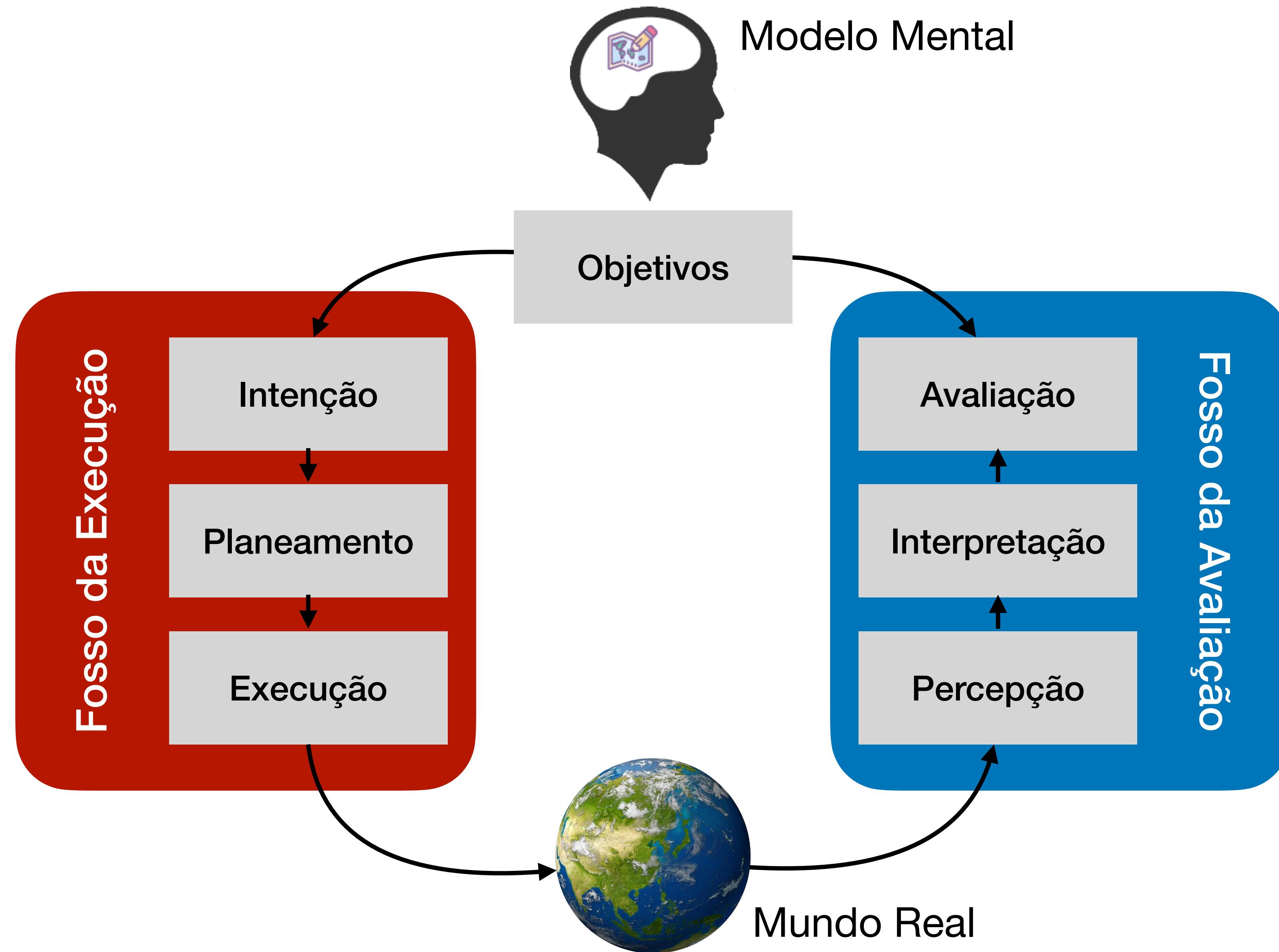
Depende de questões culturais



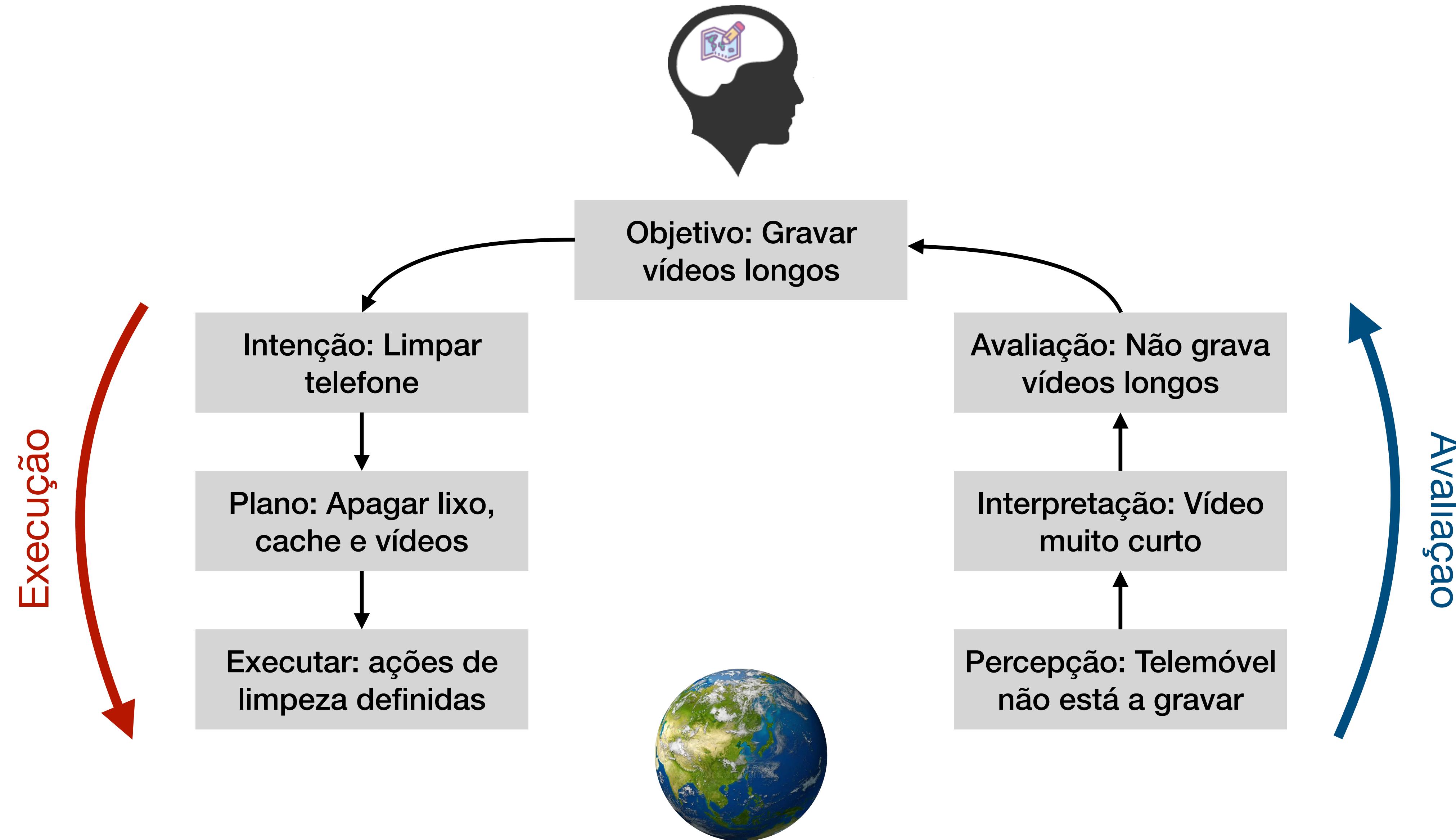
Em suma

- Para uma boa interface é necessário compreender
 - Os **utilizadores**: a usabilidade deve ser definida em relação a um tipo específico de utilizador — mas existem características gerais dos humanos que podem/devem ser consideradas.
 - As **ações** que pretendem/devem realizar: A usabilidade deve ser definida para tarefas específicas que o sistema deve suportar — no entanto, o sistema acabará muitas vezes por ser utilizado de formas não previstas inicialmente.
 - O **contexto** em que o devem fazer: O contexto em que o sistema vai ser utilizado pode influenciar não só a usabilidade do sistema, mas a forma como os testes podem decorrer.

Modelo de Interação (7 fases de ação de Norman)



Modelo de Interacção de Norman



Modelo de Interação de Norman

- **Fosso da Avaliação**

- Esforço que o utilizador tem que realizar para perceber a interface
- Distância entre o que a interface fornece e os objetivos do utilizador



Como a informação é apresentada!

- **Fosso da Execução**

- Esforço que o utilizador tem que realizar para efectuar determinada tarefa
- Distância entre os objectivos do utilizador e como os executar na interface



Como apoiar a definição de tarefas!

Fosso da Avaliação

- Será que o utilizador sabe:
 - Em que estado o sistema se encontra?
 - Se o estado atual é o estado desejado?



Fosso da Avaliação

- Será que o utilizador sabe:
 - Em que estado o sistema se encontra?
 - Se o estado atual é estado desejado?

Preencher Declaração

Anexos ^ Rosto Anexo A Anexo B Anexo H

Rosto

Anexo A Rendimentos de Trabalho Dependente e Pensões [trash]

Anexo B 205479332 Rendimentos da Categoria B [trash]

Anexo H Benefícios fiscais e Deduções [trash]

+ Adicionar Anexo

Adicionar:

Anexo A Rendimentos de Trabalho Dependente e Pensões

Anexo B Rendimentos da Categoria B

Anexo C Rendimentos da Categoria B, Regime Contabilidade Organizada

Anexo D Transparência Fiscal e Herança Indivisa, Imputação de Rendimentos

Anexo E Rendimentos de Capitais

Anexo F Rendimentos Prediais

Anexo G Mais-Valias e Outros Incrementos Patrimoniais

Anexo G1 Mais-Valias não Tributadas

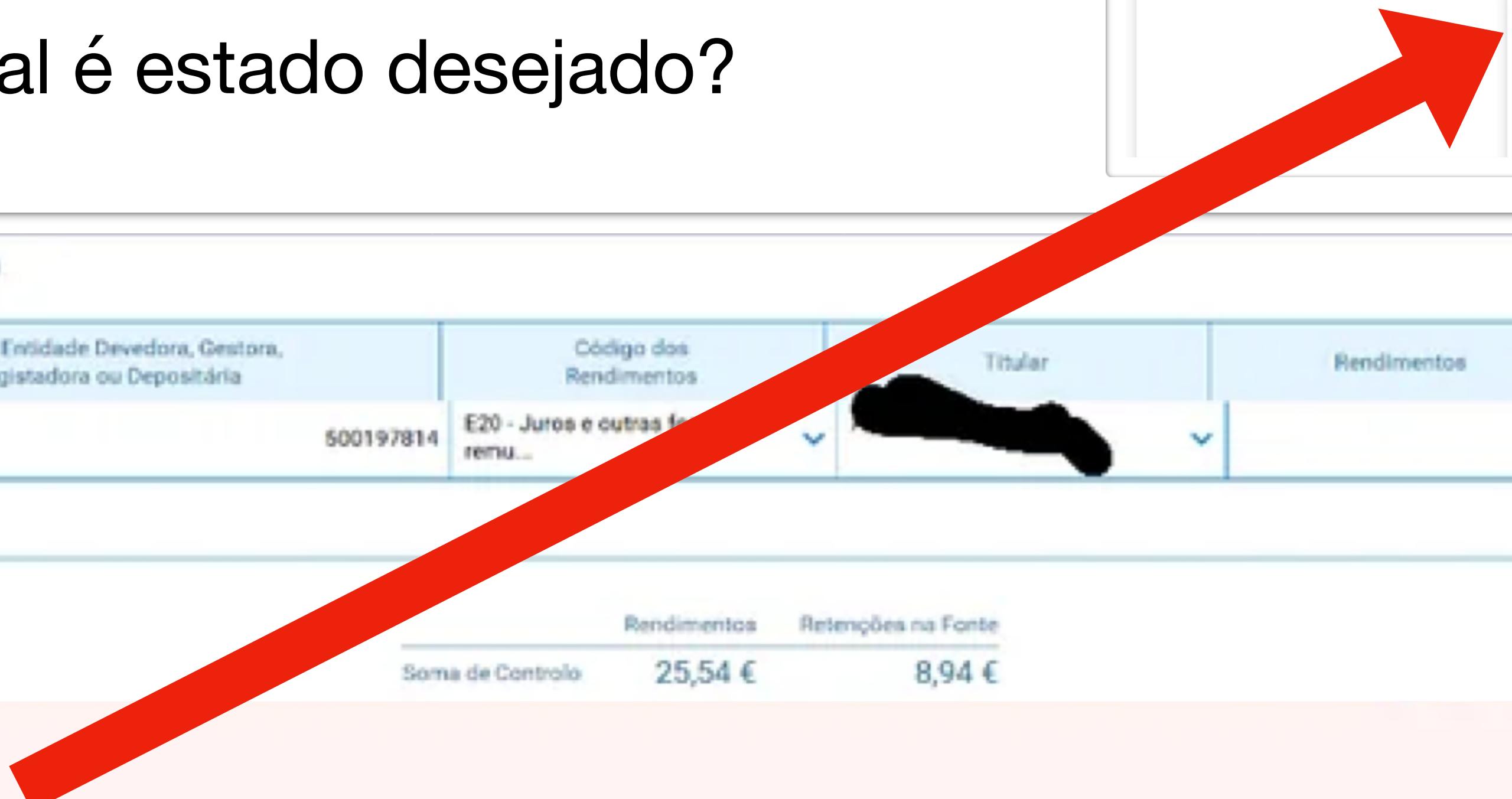
Anexo H Benefícios fiscais e Deduções

Anexo I Rendimentos de Herança Indivisa

Anexo J Rendimentos Obtidos no Estrangeiro [highlight]

Anexo L Residente não habitual

Anexo SS Segurança Social



B Rendimentos Sujeitos a Taxas Liberatórias (art.º 71.º do CIRS)

Nº Linha (451 a ...)	NIF da Entidade Devedora, Gestora, Registradora ou Depositária	Código dos Rendimentos	Titular	Rendimentos	Retenções na Fonte
1 451	500197814	E20 - Juros e outras f... remo...		25,54 €	8,94 € [trash]

+ Adicionar Linha Expandir

Rendimentos Retenções na Fonte

Soma de Controlo 25,54 € 8,94 €

! Erros

Anexo E > Quadro 4

As retenções na fonte declaradas ultrapassam o limite definido por lei. (034E)

[undo] [redo] X

Fosso da Execução

- Será que o utilizador sabe:
 - Que ações são possíveis?
 - Se as ações são fáceis de executar?



Fosso da Execução

- Será que o utilizador sabe:
 - Que ações são possíveis?
 - Se as ações são fáceis de executar?

 Adicionar Unidade Curricular

Tipo de Universidade: Ensino Superior Público Universitário
Universidade: Universidade do Minho
Ano Letivo: 2011/2012
Curso: Licenciatura em Ciências da Computação
Unidade Curricular: INTRODUCAO A INFORMATICA
Semestre: ---Selecione uma opção
N.º de Alunos Inscritos: INTRODUCAO A INFORMATICA
N.º de Alunos Repetentes: 0
Avaliação da UC: 0
N.º de Horas Lecionadas no Semestre: Teóricas: 0 Turnos: 1
Teorico-Práticas: 0 Turnos: 1
Seminários: 0 Turnos: 1
Tutoriais: 0 Turnos: 1
Laboratoriais: 0 Turnos: 1
Total de Horas Semestrais: 0 horas
Total de Horas Semanais: 0 horas
[Registrar Atividade de Ensino](#)

Atenção:
Clique em [Registrar Atividade de Ensino](#).
Após efetuar as adições de atividades deverá ir para o separador de topo 'Editar Registo' e escolher uma das opções 'Guardar' ou 'Guardar e Sair' para gravar definitivamente os seus dados.

Fosso da Avaliação vs Execução

- Qual a melhor UI?

BOLETIM DE IDENTIFICAÇÃO DA ENTIDADE

*NIF:	0 0 0 0 9 0 0 0 0 0
*Nome:	
*Morada:	(Rua, Av ^a , etc)
Localidade:	
*Cód.postal:	0 0 0 0 - 0 0 0
*Loc. do CP:	
*R.Finan.:	0 0 0 0 -
*Telefone:	(pode colocar vários nº.s)
Fax:	(pode colocar vários nº.s)
*E-mail:	
N.º S.Social:	0 0 0 0 0 0 0 0 0 0
Nº DE IDENTIFICAÇÃO BANCÁRIA (NIB)	
*Banco:	0 0 0 0
*Agência:	0 0 0 0
*Conta:	0 0 0 0 0 0 0 0 0 0
*Dígitos de Controle:	0 0
Nº DE IDENTIFICAÇÃO BANCÁRIA ASE (só para Escolas)	
*Banco:	0 0 0 0
*Agência:	0 0 0 0
*Conta:	0 0 0 0 0 0 0 0 0 0
*Dígitos de Controle:	0 0

```
X jfc@flyingmorcego.di.uminho.pt: /home/jfc
jfc@GSVLittleRascal ~
$ ssh -X morcego.gsim.di.uminho.pt
jfc@morcego.gsim.di.uminho.pt's password:
Last login: Fri Mar  4 03:02:44 2005 from vpnserver.di.uminho.pt
[jfc@flyingmorcego jfc]$ ls
20042005-OpçãoIII-Inscrições.pdf  ivy.ps
Archive/
bin/
cartaD.jpg
ceiareis.jpg
config.xml
Desktop/
Desktop1/
Documents/
ds@
Ensino/
ESI_3.pdf
flier.pdf
Fun/
Gestao/
Investigacao/
Invitation.pdf
[jfc@flyingmorcego jfc]$
```

Mau design pode ser embaraçoso...



The image is a composite of two photographs. On the right, a close-up portrait of a man with grey hair, wearing a dark tuxedo and a white shirt with a black bow tie. He has a slight smile and is looking towards the camera. On the left, a large Oscar statuette is shown from the waist up. It is a classic Academy Award figure, standing on a base. The base features the word "OSCARS." in a yellow rectangular area, with "THE" written above it in smaller letters. Below the statue, the word "Vox" is printed in a large, stylized, lowercase font. To the right of "Vox", the words "Best Picture" are written in a smaller, green rectangular box.

THE
OSCAR®

"MOONLIGHT"

ADELE ROMANSKI, DEDE GARDNER
AND JEREMY KLEINER, PRODUCERS

Vox

Best Picture

... e não só

- Financial Trading
- Eleições



(REPUBLICAN)	
GEORGE W. BUSH PRESIDENT	3→
DICK CHENEY VICE PRESIDENT	
(DEMOCRATIC)	← 4
AL GORE PRESIDENT	5→
JOE LIEBERMAN VICE PRESIDENT	
(LIBERTARIAN)	← 6
HARRY BROWNE PRESIDENT	7→
ART OLIVIER VICE PRESIDENT	
(GREEN)	← 8
RALPH NADER PRESIDENT	9→
WINONA LaDUKE VICE PRESIDENT	
(SOCIALIST WORKERS)	← 10
JAMES HARRIS PRESIDENT	11→
(REFORM)	
PAT BUCHANAN PRESIDENT	
EZOLA FOSTER VICE PRESIDENT	
(SOCIALIST)	
DAVID McREYNOLDS PRESIDENT	
MARY CAL HOLLIS VICE PRESIDENT	
(CONSTITUTION)	
HOWARD PHILLIPS PRESIDENT	
J. CURTIS FRAZIER VICE PRESIDENT	
(WORKERS WORLD)	
MONICA MOOREHEAD PRESIDENT	
GLORIA La RIVA VICE PRESIDENT	

Uma questão de lei

- EC Directive 90/270/EEC (1990, last revised 2019)
- **employers must ensure** the following when designing, selecting, commissioning or modifying software:
 - that it is **suitable** for the task, easy to **use** and adaptable to the user's knowledge
 - that it provides **feedback** on performance
 - that it displays information in a format and at a pace that is **adapted to the user**
 - that it conforms to the **principles of software ergonomics** (ISO 9241-11)

21.6.1990 EN Official Journal of the European Communities L 156/14

COUNCIL DIRECTIVE
of 29 May 1990
on the minimum safety and health requirements for work with display screen equipment (fifth individual Directive within the meaning of Article 16 (1) of Directive 87/391/EEC)
(90/270/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,
Having regard to the Treaty establishing the European Economic Community, and in particular Article 118a thereof,
Having regard to the Commission proposal ⁽¹⁾ drawn up after consultation with the Advisory Committee on Safety, Hygiene and Health Protection at Work,
In cooperation with the European Parliament ⁽²⁾
Having regard to the opinion of the Economic and Social Committee ⁽³⁾,
Whereas Article 118a of the Treaty provides that the Council shall adopt, by means of Directives, minimum requirements designed to encourage improvements, especially in the working environment, to ensure a better level of protection of workers' safety and health;
Whereas, under the terms of that Article, those Directives shall avoid imposing administrative, financial and legal constraints, in a way which would hold back the creation and development of small and medium-sized undertakings;
Whereas the communication from the Commission on its programme concerning safety, hygiene and health at work ⁽⁴⁾ provides for the adoption of measures in respect of new technologies; whereas the Council has taken note thereof in its resolution of 21 December 1987 on safety, hygiene and health at work ⁽⁵⁾;
Whereas compliance with the minimum requirements for ensuring a better level of safety at workstations with display screens is essential for ensuring the safety and health of workers;
Whereas this Directive is an individual Directive within the meaning of Article 16 (1) of Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work ⁽⁶⁾; whereas the provisions of the latter are therefore fully applicable to the use by workers of display screen equipment, without prejudice to more stringent and/or specific provisions contained in the present Directive;
Whereas employers are obliged to keep themselves informed of the latest advances in technology and scientific findings concerning workstation design so that they can make any changes necessary so as to be able to guarantee a better level of protection of workers' safety and health;
Whereas the ergonomic aspects are of particular importance for a workstation with display screen equipment;
Whereas this Directive is a practical contribution towards creating the social dimension of the internal market;
Whereas, pursuant to Decision 74/325/EEC ⁽⁷⁾, the Advisory Committee on Safety, Hygiene and Health Protection at Work shall be consulted by the Commission on the drawing-up of proposals in this field,

HAS ADOPTED THIS DIRECTIVE:

E para sistemas críticos?

- O custo pode ser em vidas

