

SNU CSE 4190.426A

Human-Computer Interaction

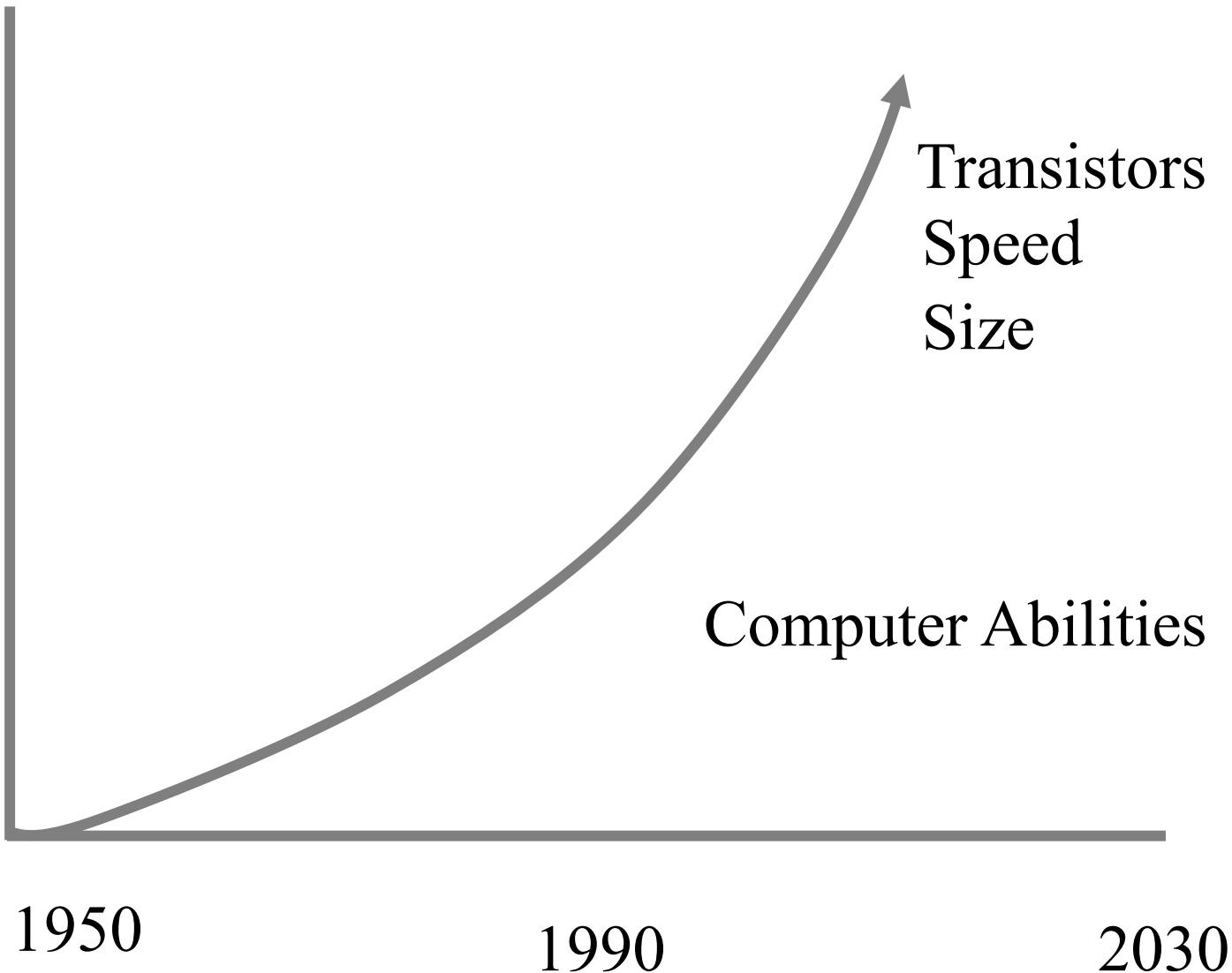
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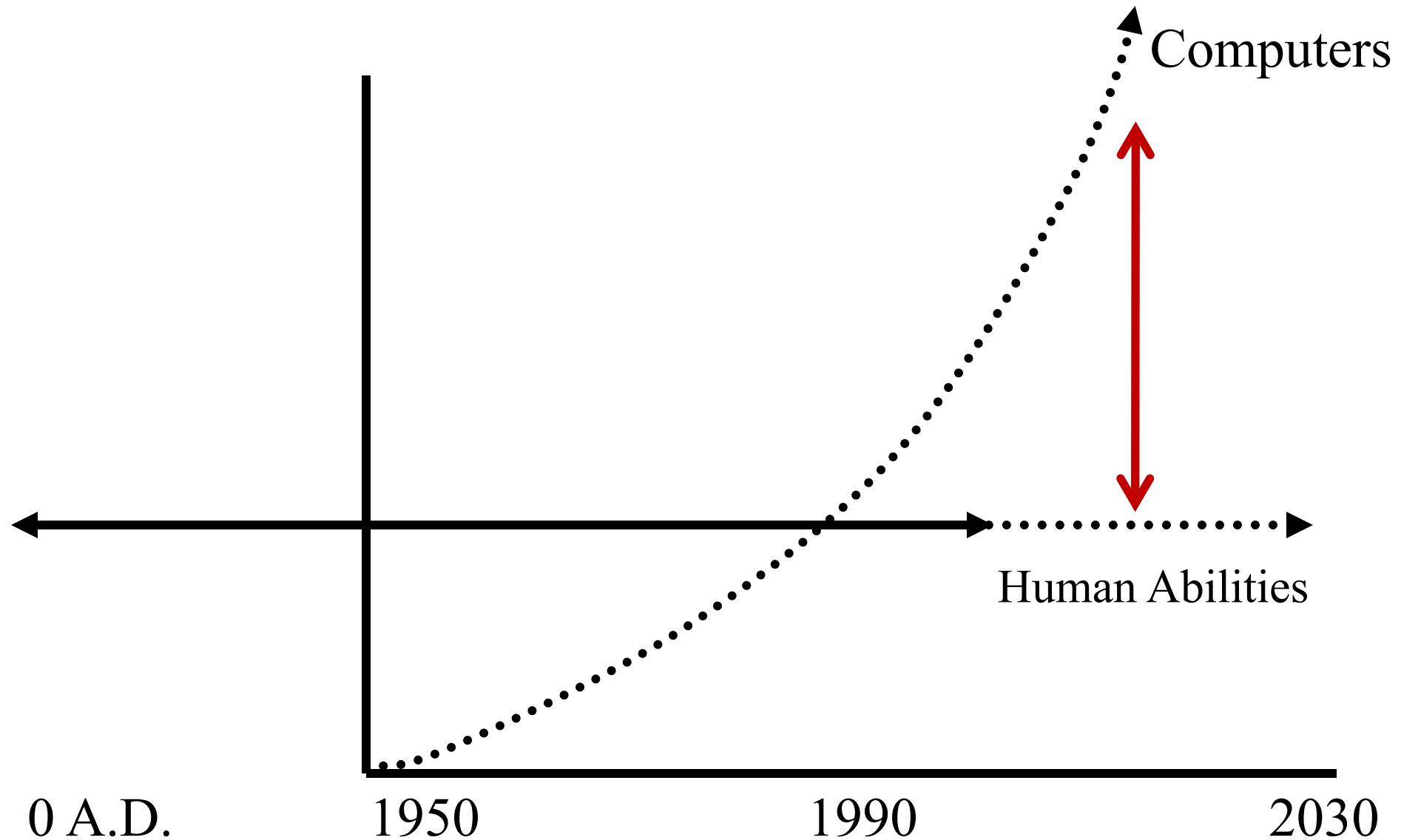
HCI and User Experience

Definitions and goals

Moore's Law



Human Capability



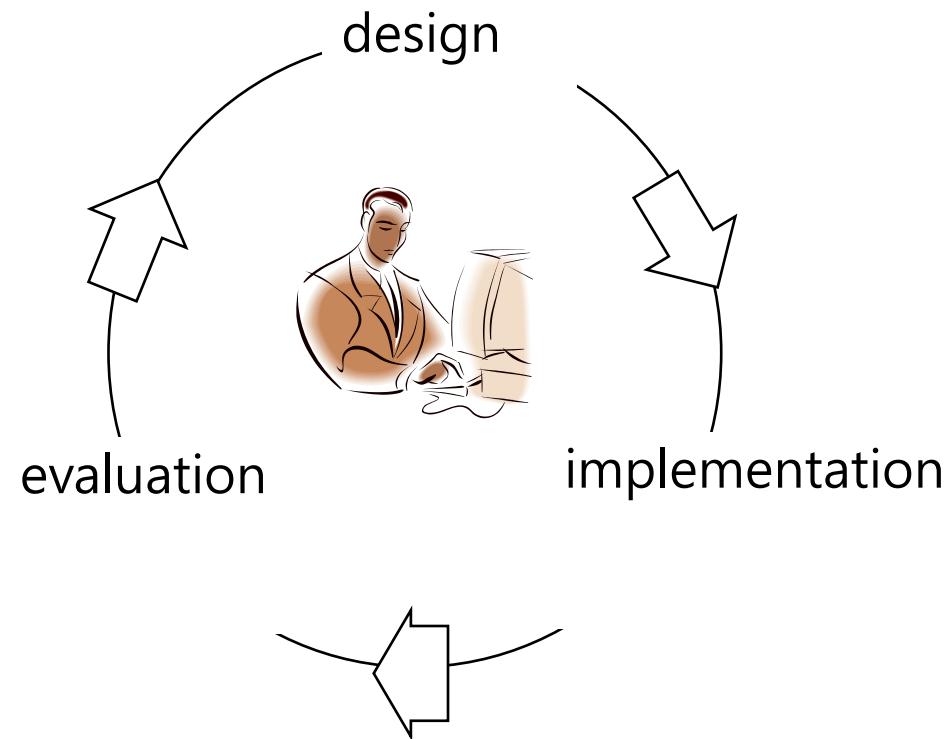
HCI: Human-Computer Interaction

A discipline concerned
with the

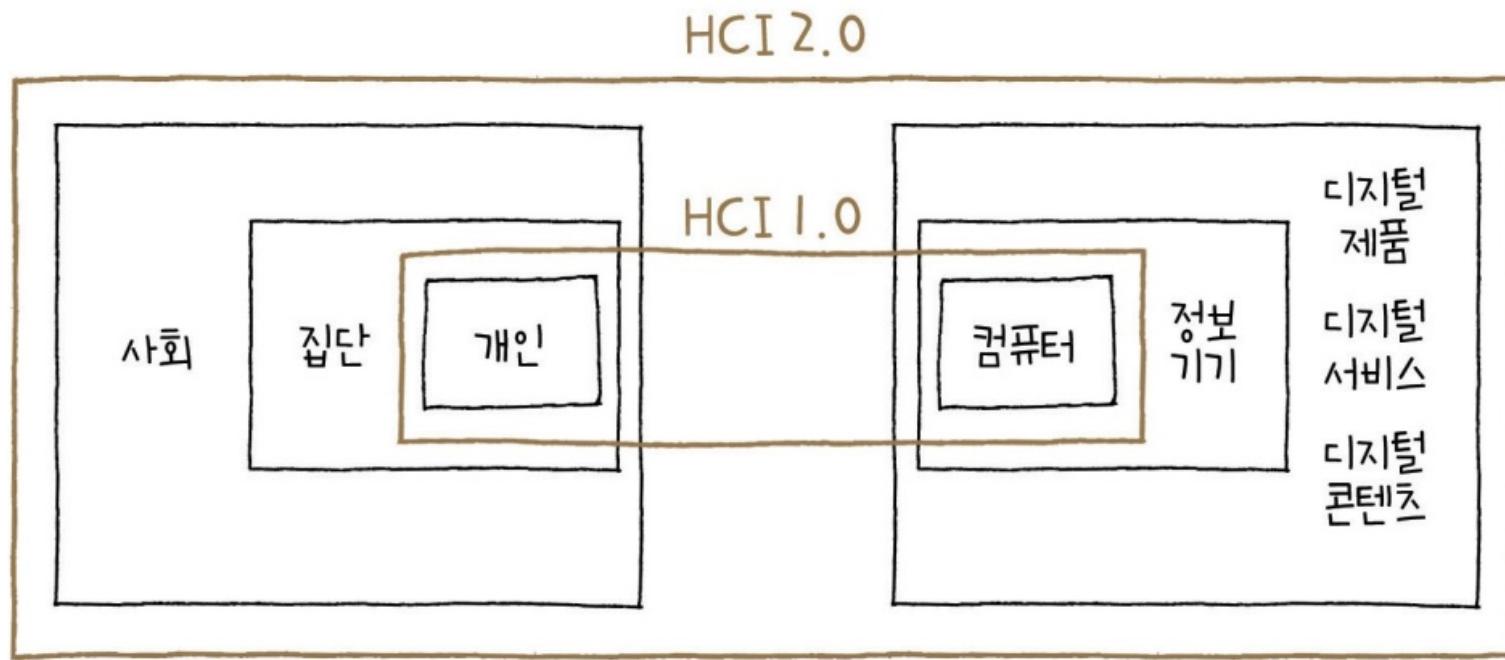
**analysis,
design,
implementation, and
evaluation**

of interactive computing systems for
human use and

with the study of major phenomena
surrounding them

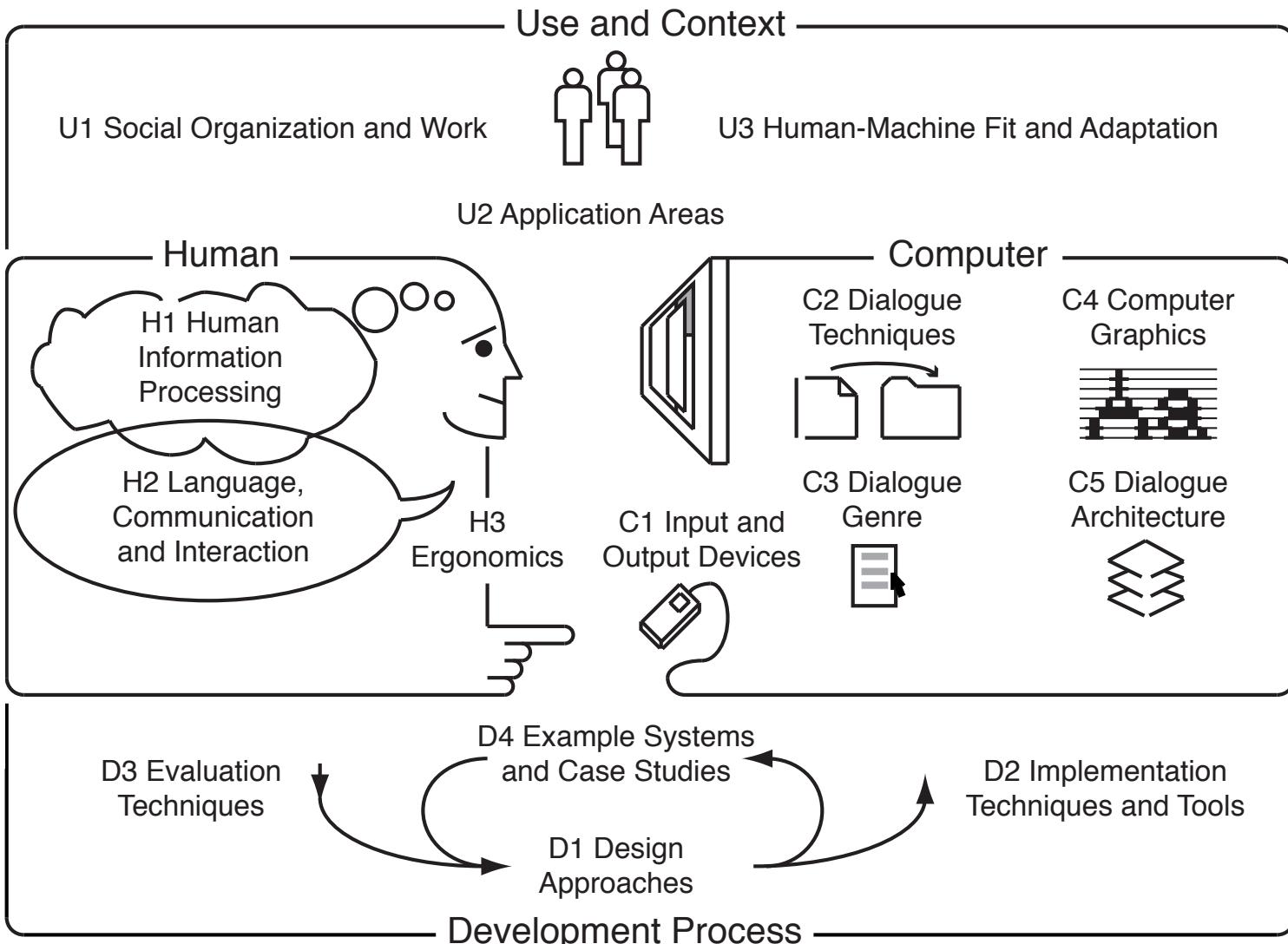


HCI 1.0 vs. HCI 2.0



Content of HCI

N	The Nature of HCI
U	N1 (Meta-)Models of HCI
H	Use and Context of Computers
C	Human Characteristics
D	Computer System and Interface Architecture
P	Development Process
	Project Presentations and Examinations



전반적으로 HCI 가 중요해지는 배경

- Users
 - For heterogeneous & diverse users
 - Wider penetration into the society
 - For novice users with less technical expertise
 - Use as tools, not for goals
 - For almost every task in everyday life
- Technology
 - Mobile
 - Smart phones and tabs and notes.
 - Combination of computer and communication => world-wide connectivity (internet & cellular phone)
 - Ubiquitous
 - Faster, reliable, smaller, and less expensive
 - Becomes invisible and distributed => deep into the everyday life (invisible computer & information appliance)
 - Ambient
 - Much bigger, more complicated, easier to construct,
 - But, not many people actually dare to develop software by themselves (lack of usage, difficult to develop).
- Business
 - Bigger and Stronger
 - 건당 2000만원 vs. 1조 1900억원



Importance of HCI

PRODUCTS INVOLVED IN THE TRIAL:

- iPhone 3G
- iPhone 3GS
- iPhone 4**
- iPad 2 3G
- iPod Touch

Photos: El Tiempo/Zuma Press (Galaxy S); Apple (iPhone 4)
The Wall Street Journal
Source: WSJ research

Samsung Says...

...THE IPHONE 4 INFRINGES THESE PATENTS:

- PATENT '516**
Manages the phone's resources and battery by prioritizing data
- PATENT '941**
Provides a way to package and transmit data more efficiently

Apple Says...

...THE GALAXY S INFRINGES THESE PATENTS:

- PATENTS '087, '677**
Ornamental design of the iPhone
- PATENT '305**
Rounded square icons on interface

Captivate
Continuum
Droid Charge
Epic 4G
Exhibit 4G
Fascinate
Galaxy Ace
Galaxy Prevail
Galaxy S
Galaxy S 4G
Galaxy S II (AT&T)
Galaxy S II (i9100)
Galaxy S II (T-Mobile)
Galaxy S II (Epic 4G)
Galaxy S II (Skyrocket)
Galaxy S Showcase
Galaxy Tab
Galaxy Tab 10.1 (WiFi)
Galaxy Tab 10.1 (4G LTE)
Gem
Indulge
Infuse 4G
Intercept
Mesmerize
Nexus S 4G
Replenish
Transform
Vibrant

PATENT '711
A method allowing multi-tasking while playing music on the phone

PATENT '460
Taking and emailing pictures using a scroll action

PATENT '893
Switching between pictures in a gallery and the camera

PATENT '163
Enlarging documents by tapping the screen

PATENT '915
Distinguishes between single-touch and multi-touch gestures

PATENT '381
'Bounce-back' feature when scrolling beyond the edge of a page

Importance of HCI

9. What is the total dollar amount that Apple is entitled to receive from Samsung on the claims on which you have ruled in favor of Apple?
14. What is the total dollar amount that Samsung is entitled to receive from Apple on the claims on which you have ruled in favor of Samsung?

\$ 119,625,000.00

Accused Samsung Product	'647 Patent Claim 9	'959 Patent Claim 25	'414 Patent Claim 20	'721 Patent Claim 8	'172 Patent Claim 18	TOTAL
Admire (JX28)	7,599,178	\$	\$	1,372,696	2,655,675	11,627,549
Galaxy Nexus (JX29)	3,158,100	\$	\$	867,281	1,579,050	5,604,431
Galaxy Note (JX30)	1,677,740	\$	\$		1,146,343	2,844,083
Galaxy Note II (JX31)	8,684,775	\$	\$			8,684,775
Galaxy S II (JX32)	8,625,560	\$	\$	\$	\$	8,625,560
Galaxy S II Epic 4G Touch (JX33)	10,145,134	\$	\$	\$	4,019,400	14,184,534
Galaxy S II Skyrocket (JX34)	2,467,245	\$	\$	\$	5,849,462	8,316,927
Galaxy S III (JX35)	52,404,721	\$	\$			52,404,721
Galaxy Tab 2 10.1 (JX36)		\$	\$			\$
Stratosphere (JX37)	3,908,152	\$	\$	750,648	2,673,620	7,332,420

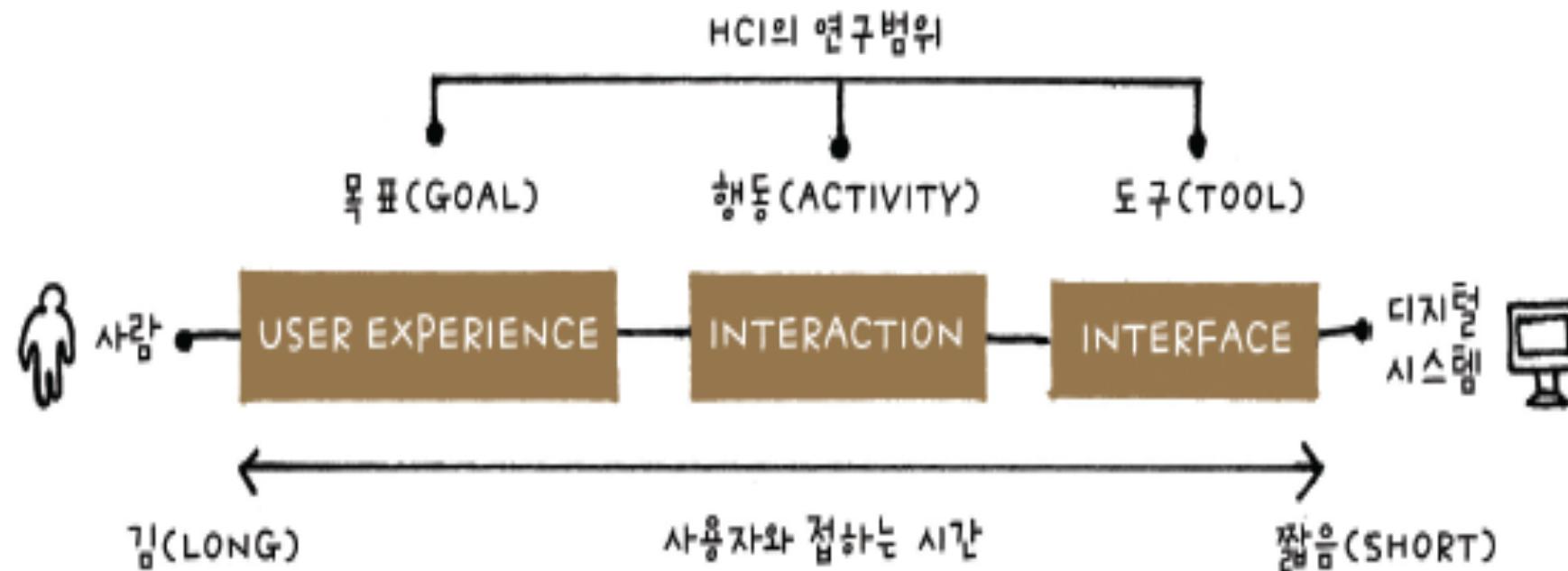
\$ 158,400.00

Accused Apple Product	'449 Patent Claim 27	'239 Patent Claim 15	TOTAL
iPhone 4 (JX38)	20,591.00	\$	20,591.00
iPhone 4S (JX39)	28,474.00	\$	28,474.00
iPhone 5 (JX40)	41,514.00	\$	41,514.00
iPod Touch, 4th gen. (JX46)	40,597.00		40,597.00
iPod Touch, 5th gen. (JX45)	27,224.00		27,224.00

Importance of HCI

- 9. The system recited in claim 1, wherein the **user interface** enables selection of an action by causing the output device to display a pop-up menu of the linked actions.
- 8. The device of claim 7, further comprising instructions to **display visual cues** to communicate a direction of movement of the unlock image required to unlock the device.
- 18. A **graphical user interface** on a portable electronic device with a keyboard and a touch screen display, comprising...
- 27. A digital camera according to claim 25, wherein said classification is able to change by a direction of a user.

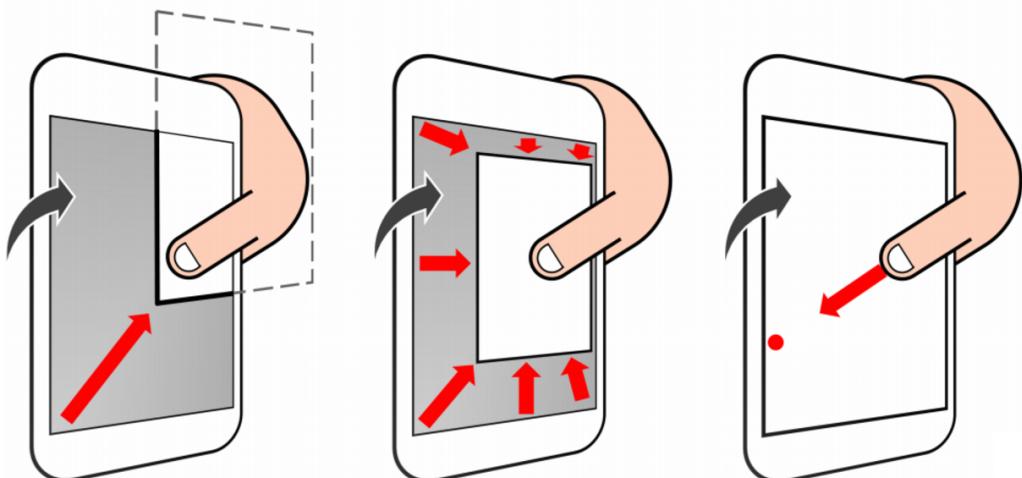
HCI의 연구 범위 및 관련 용어



Interface



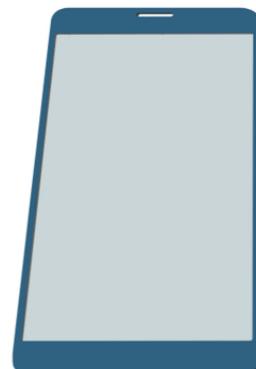
Interaction



(a) Closed



(b) Peaked



(c) Opened



Experience



12 million children have slept in its seats.

New Golf. Born with experience.



User Experience

- “a person’s **perceptions** and **responses** that result from the use or anticipated use of a product, system or service” (ISO 9241-210)
- How a product behaves and is used by people in the real world
 - the way people **feel** about it and their **pleasure** and **satisfaction** when using it, looking at it, holding it, and opening or closing it
 - “every product that is used by someone has a user experience: newspapers, ketchup bottles, reclining armchairs, cardigan sweaters.” (Garrett, 2003)
- Cannot design a user experience, only design *for* a user experience

User Experience Goals

Desirable aspects

satisfying	helpful	fun
enjoyable	motivating	provocative
engaging	challenging	surprising
pleasurable	enhancing	sociability rewarding
exciting	supporting creativity	emotionally fulfilling
entertaining	cognitively stimulating	

Undesirable aspects

boring	unpleasant
frustrating	patronizing
making one feel guilty	making one feel stupid
annoying	cutesy
childish	gimmicky

*What are the main
characteristics of UX?*

Humane BUT Soft



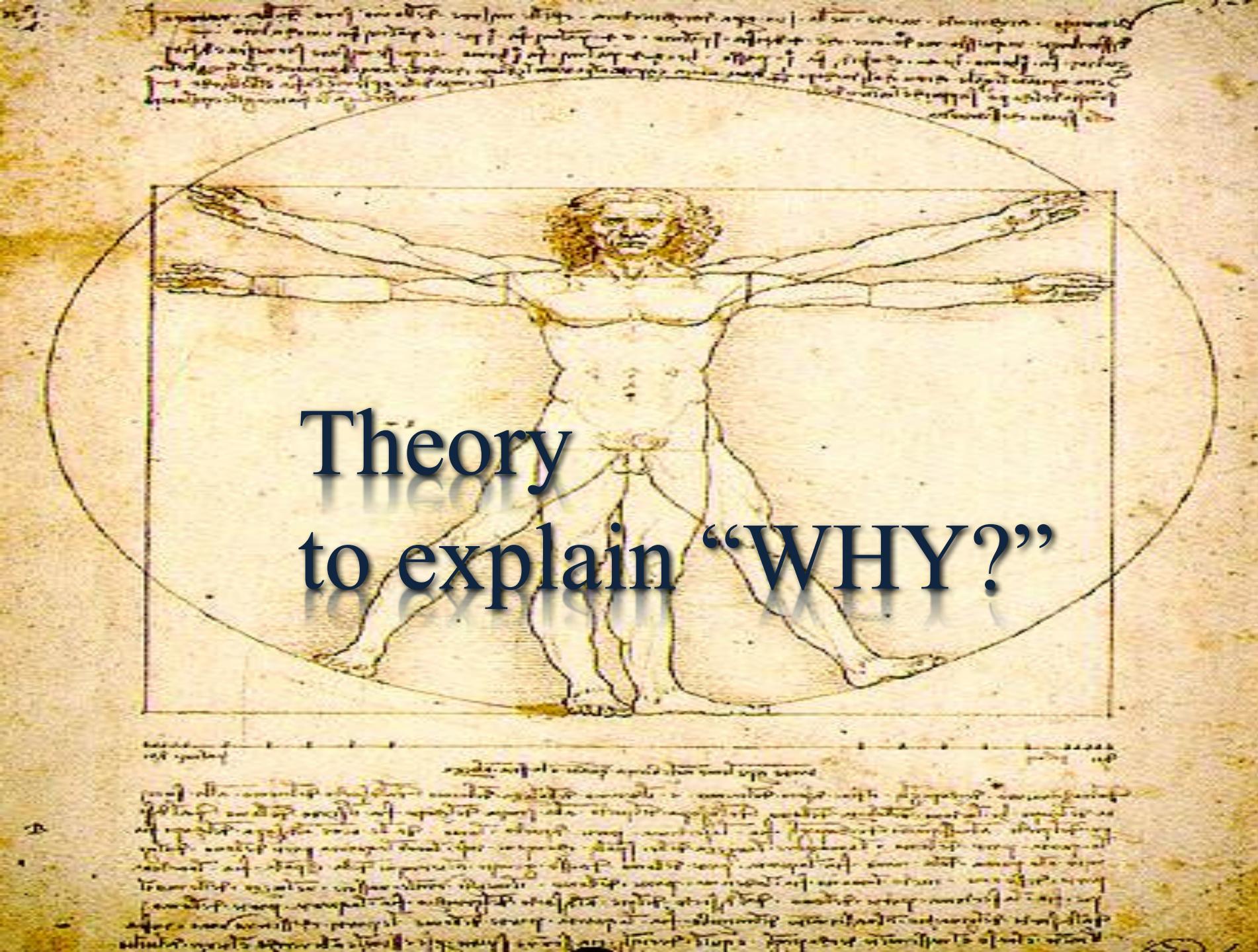
A wide-angle photograph of a rural landscape. In the foreground, there are rolling green hills with some dark, possibly burnt or dry, patches. A winding road or path cuts through the center of the frame. In the middle ground, there are more hills and fields, some with small clusters of trees. The background features a range of mountains under a sky filled with white and grey clouds.

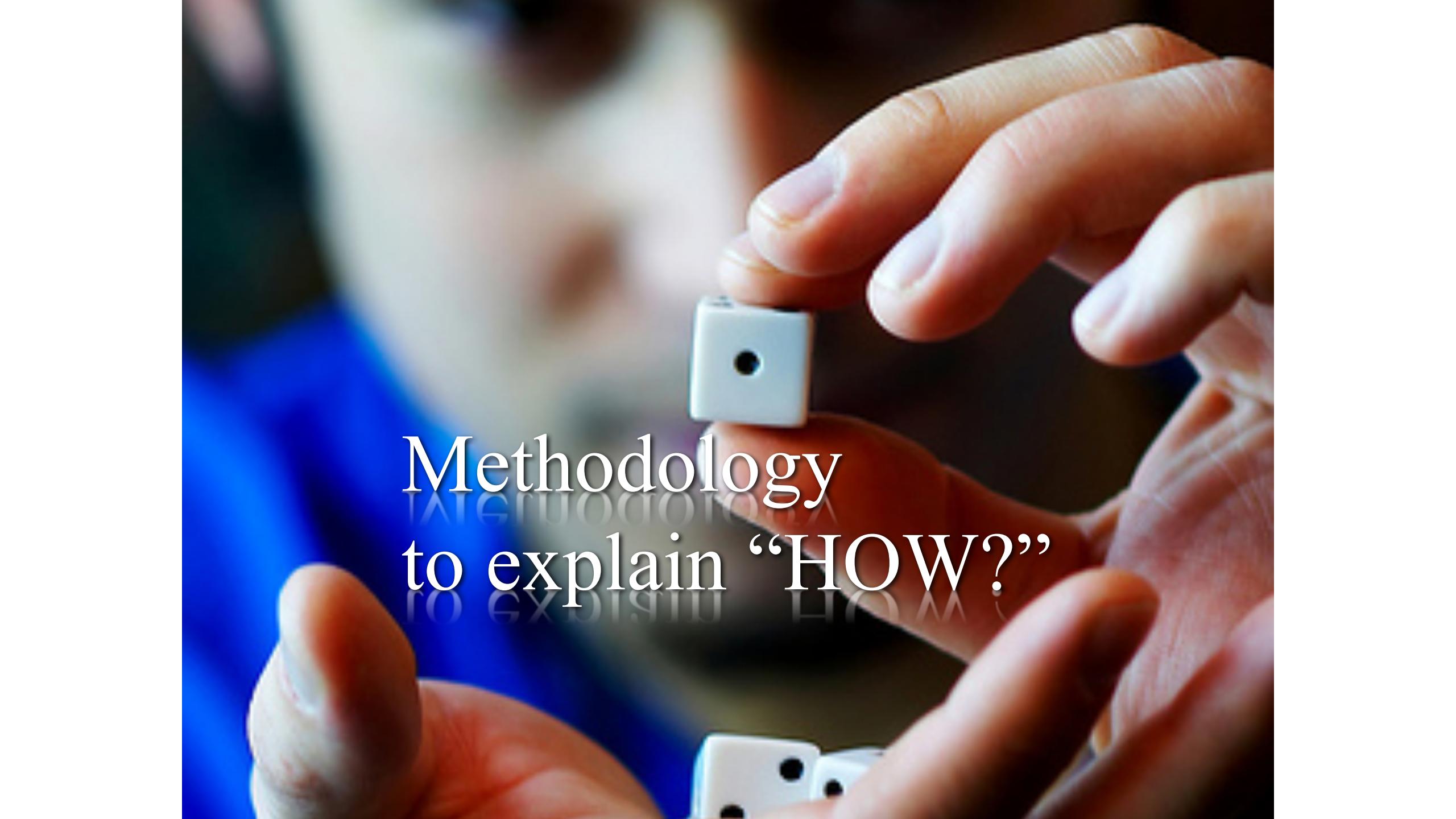
Strategic BUT *Abstract*



Contextual
BUT

Theory to explain “WHY?”



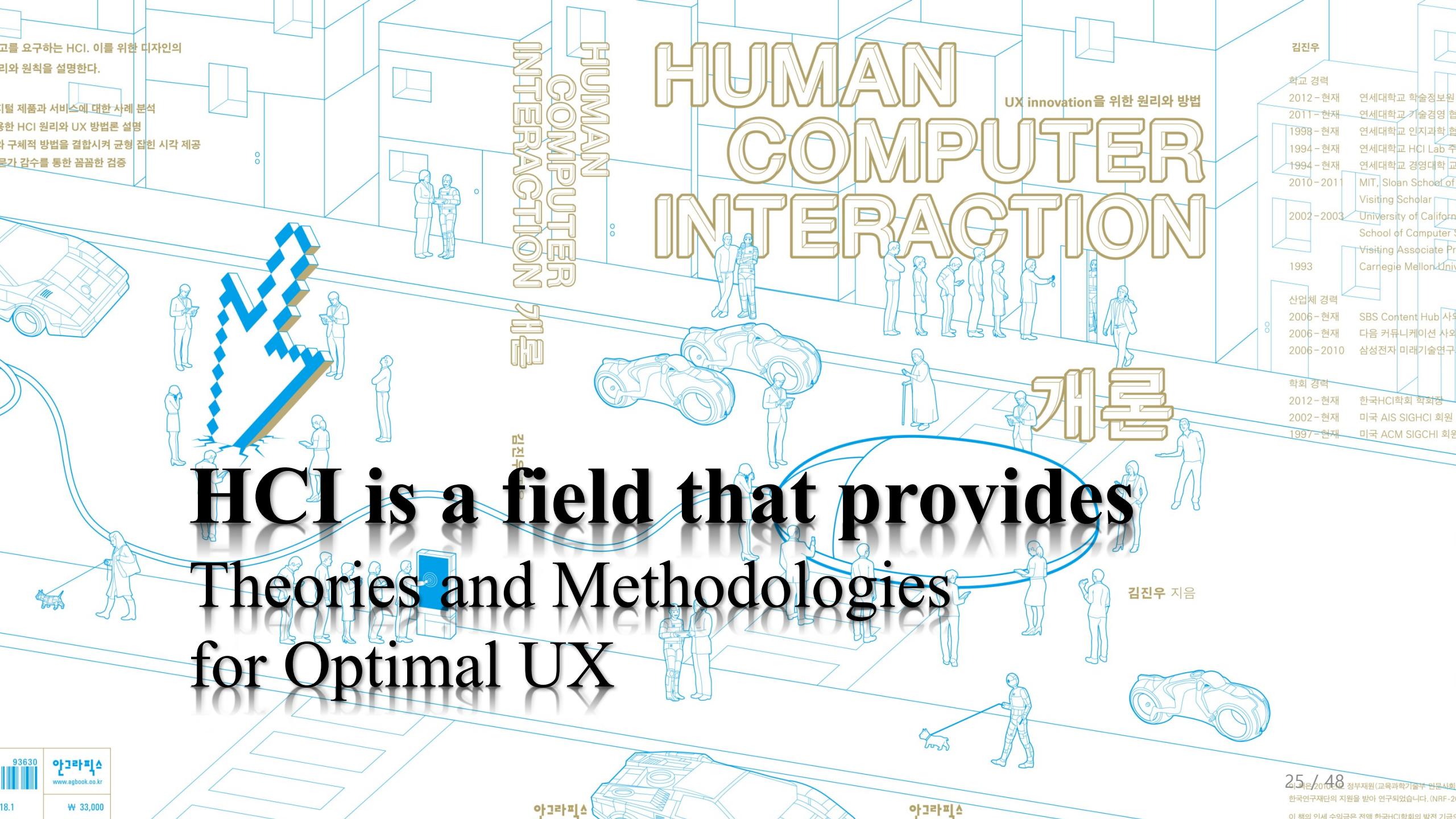


Methodology
to explain “HOW?”

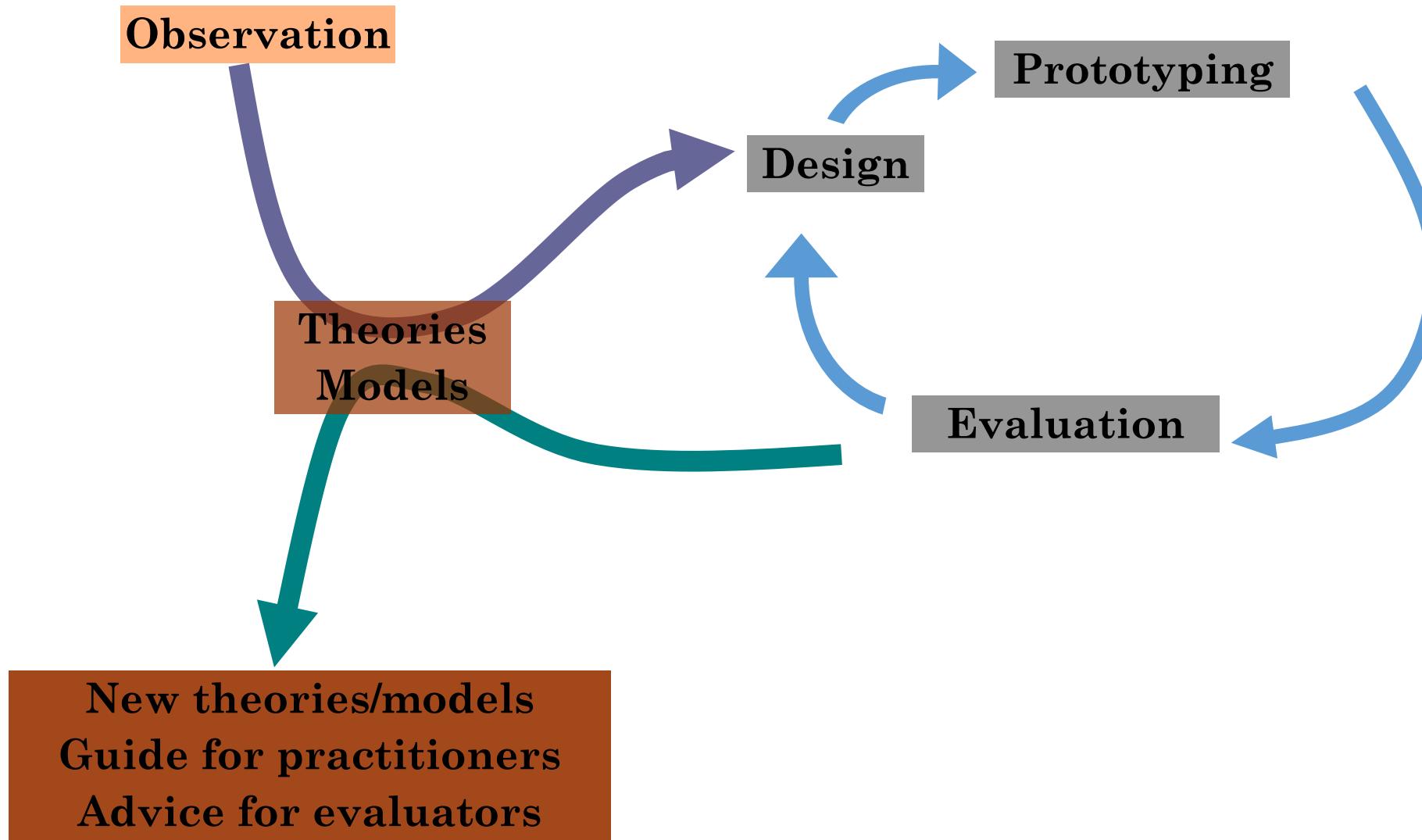
A photograph of a man in traditional white clothing riding a camel through a desert landscape. In the background, a large pyramid is visible, partially obscured by sand and dust. The scene is set against a hazy, golden-yellow sky, creating a classic mirage effect.

UX can be just a mirage !!

without
proper theories and methodologies



Research Framework



A photograph of a woman with blonde hair, wearing a red sweater, laughing heartily. She is holding a young child with light-colored hair who is shouting or crying with their mouth wide open. They are in what appears to be a theater or auditorium, with other people visible in the background.

Optimal User Experience: Ultimate Goal of HCI

Optimal User Experience



12 million children have slept in its seats.

New Golf. Born with experience.



Goal of HCI

- Optimal User Experience
- Key Factors of Optimal User Experience
 - **Usefulness** (유용성)
 - help users achieve their goals (effectively)
 - **Usability** (사용성)
 - use with ease, efficiency, and satisfaction
 - **Affection** (감성)
 - *aesthetic* response
 - *semantic* and symbolic meanings
 - goal achievement and its *emotional* consequence

First Principle of Optimal User Experience

Usefulness



과거 1세대 핸드폰



**USEFULNESS
in Products**



USEFULNESS in cars



Usability (사용성)

- The extent to which a product can be used by *specified* users to achieve *specified* goals with **effectiveness**, **efficiency**, and **satisfaction** in a *specified* context of use.
 - ISO 9241-11: Guidance on Usability (1998)
 - Users
 - Goals (and tasks)
 - Context

편리한 인터페이스를 강조하는 핸드폰



USABILITY in Products

Usability Goals

- (Have good utility)
- Effective to use
- Efficient to use
- Easy to learn
- Easy to remember how to use
- Safe to use
- How to measure it? → Usability Criteria
 - time to learn (**learnability**)
 - speed of performance (**efficiency**)
 - rate of human error (**effectiveness**)
 - human retention over time (**memorability**)
 - subjective satisfaction

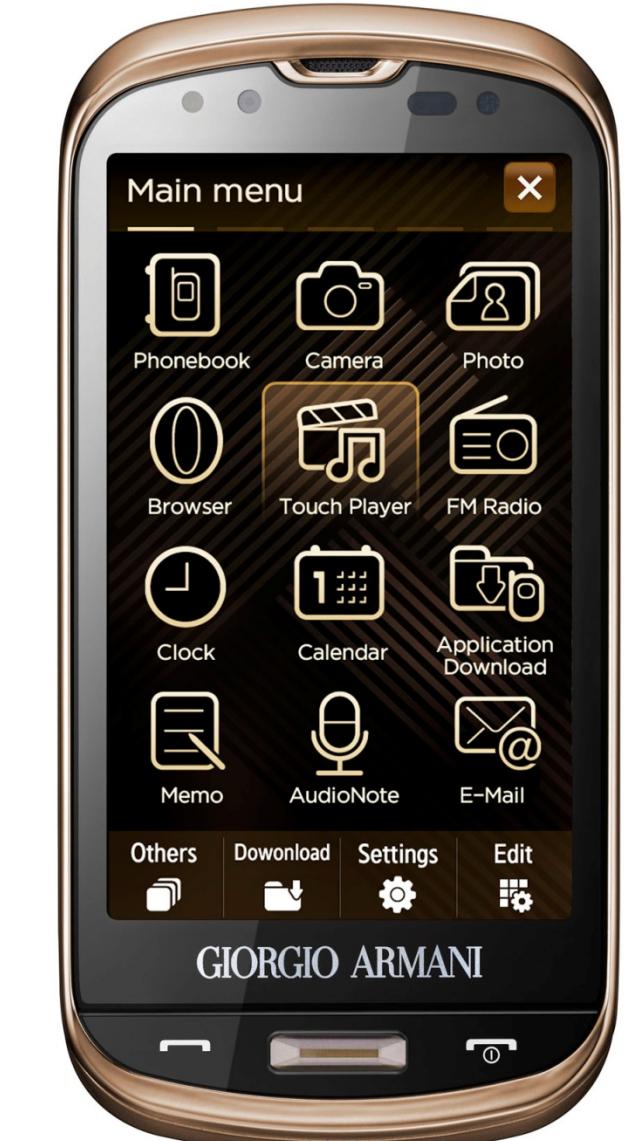
Beyond Usability – Affection (감성)

- design to persuade people
- make shopping easy vs. persuade people to buy
- persuade in subtle and pleasant ways
- Emotional Design (Donald Norman)
 - using pre-existing perception to persuade users
 - design of objects are perceived on three levels:
 - visceral, behavioral, reflective levels



AFFECTABILITY in Cars





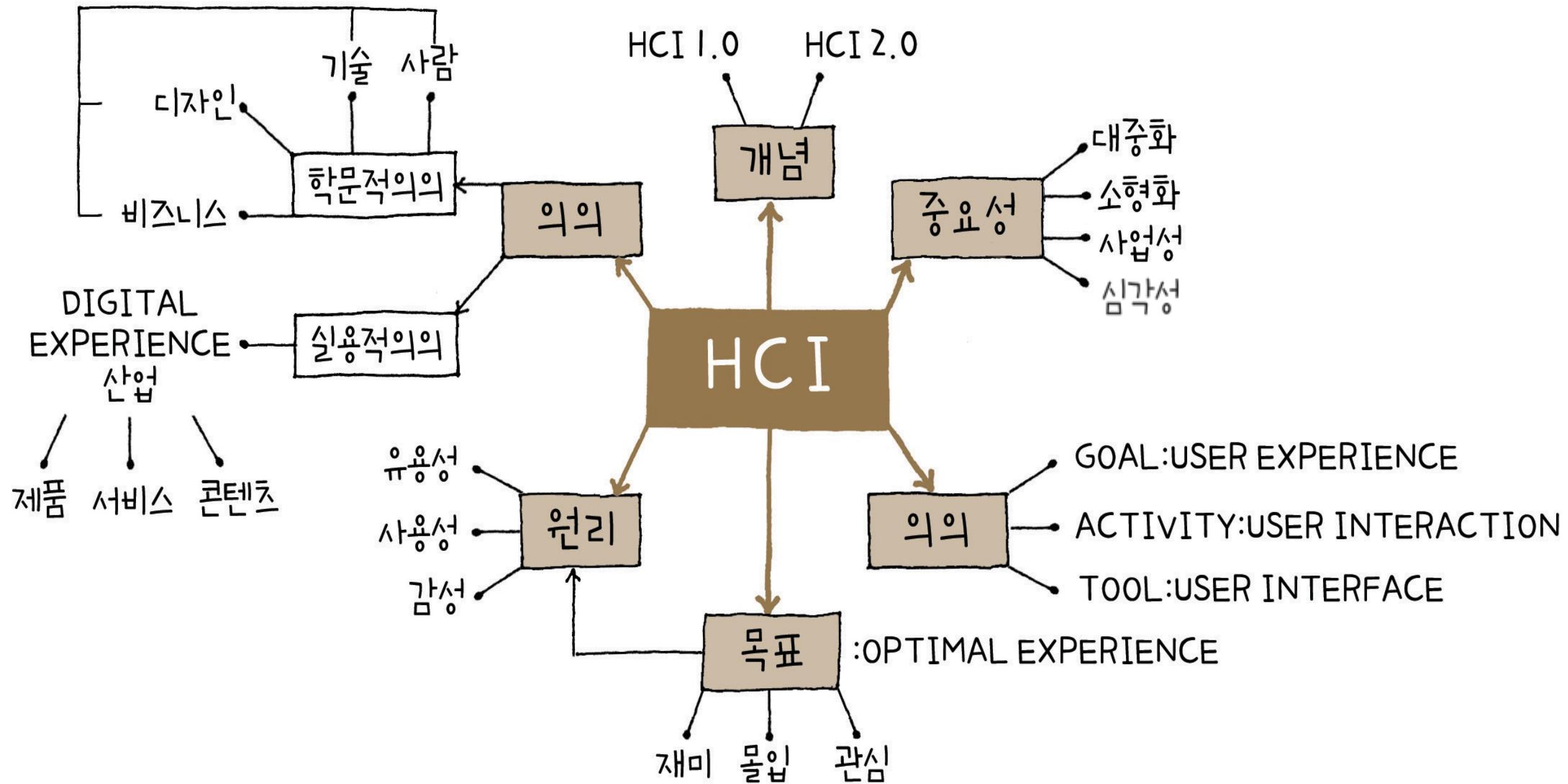
AFFECTABILITY
in Products



경험의 삼박자



MULTI-DISCIPLINARY



Announcements

- Homework #1
 - Read chapter 1, HCI 개론
 - Submit 1~2 paragraph summary or commentary
 - By 3/14
- Lab session by TA, 3/16
 - Self-study homework

Acknowledgement

- 김진우, 연세대학교
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