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www.creative-science.org

<http://linkd.in/1xUMdJD>

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Supporting Digital Innovation Through Science Fiction Prototyping

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Overview of Talk

*“This talk seeks to introduce **science-fiction prototyping (SFP)** as a methodology for inspiring, capturing and communicating innovations for scientific, business and societal innovations”.*

- Imaginative Leaps
- The Intel Story
- SFP Methodology
- Some Examples
- Summary



These notes are available to download from:

[http://victor.callaghan.info/publications/2015_Brunel\(SupportingDigitalInnovation\).pdf](http://victor.callaghan.info/publications/2015_Brunel(SupportingDigitalInnovation).pdf)



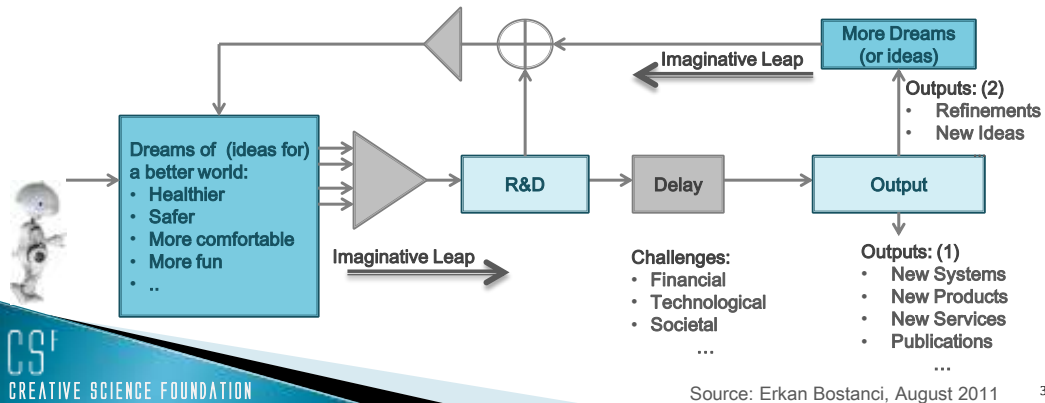
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The Creative Science Cycle

In the beginning we **dream of a better world**. We may want the world to be **healthier**—(eg wearable technology), safer (eg intelligent vehicles), **more comfortable** (eg smart homes) or **more fun** (eg interactive games).

These **dreams** come together (integrator symbol) and feed the research. Research produces outputs but with delay due to the technological or financial challenges. There are two types of outputs; tangible outputs such as products / publications or abstractions (more dreams because we will never be satisfied with what we have!).

New **dreams**, as the research outputs, feed our old dreams but this time they may need some amplification because according to our research results, we may end up thinking that something is not achievable. So the "Creative Science Cycle" goes on.

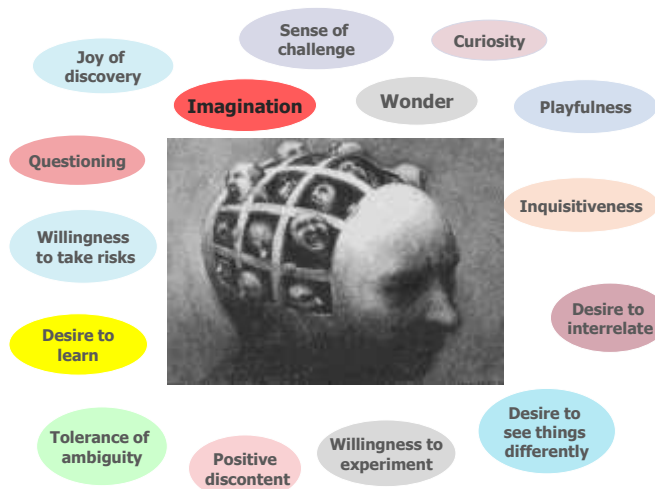


Source: Erkan Bostanci, August 2011

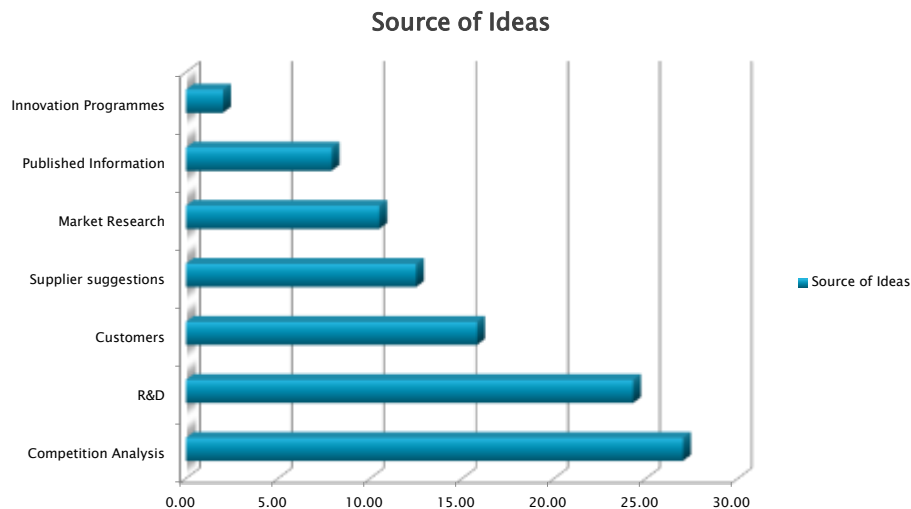
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Where do new ideas or 'imaginative leaps' come from?

- ▶ How do we get ideas
- ▶ Where do they come from?
- ▶ How do we communicate ideas?
- ▶ Is there anything we can do to help us get ideas
- ▶ Ideas are important as they help us:
 - Solve problems
 - Create new products
 - etc
- ▶ Good ideas are worth a lot of money!



Where Do Businesses Get New Product Ideas?



The Story

Image from drawing by Paul Rumsey

- ▶ Intel's 'chip life cycles' occupy about 7–10 years from concept to shipping (and maybe another 15 years of product life)!
- ▶ How can they specify chips for worlds that don't exist yet?
 - Maybe use techniques on previous slide?
 - But, they wanted to be smarter, get better ideas than their competitors!
- ▶ The main Intel resource is engineers (but traditional engineering education encourages structured & incremental thought!)
- ▶ Intel decided the magic ingredient was **imagination**
- ▶ The **Intel solution** was to ask their engineers to write fictional stories about technologies they are working on, to inject **imaginative leaps** in their thinking!



Science Fiction Prototyping



- ▶ Method uses peoples imagination to write short fictional stories that extrapolate real science & technology forward in time to create a **Prototype** of future lives (that can test ideas).
- ▶ Story needs to be a credible (believable) description of a possible life.
- ▶ Everyone understands a story so its perfect for communication between different types of people
- ▶ Outcomes of SFPs are used to create new kinds of products, businesses, social structures etc



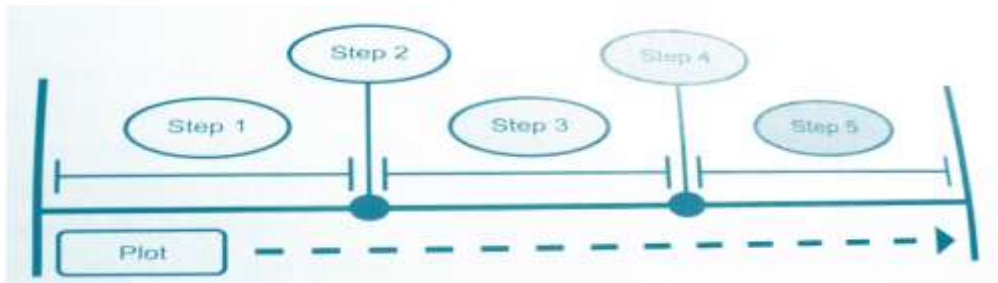
Intel / CSF Video From CS'11

- ▶ SFP uses short stories about the future to inject imaginative leaps and provide a shared language for innovation

VIDEO INTRODUCING
SCIENCE FICTION
PROTOTYPING



Johnson's 5 Steps for Writing SFPs



Step 1: Pick Your Science and Build Your World

Step 2: Identify the Scientific Inflection Point

Step 3: Consider ramifications of the Science on People

Step 4: Identify the Human Inflection Point

Step 5: Reflect on what Did We Learn?



SF-Prototype Structure

Hybrid between a story
and scientific paper

- ▶ **Typical size** – 10–12 pages (or 4–6 pages for short SFPs)
- ▶ **Structure** (can be viewed as a hybrid between a story and scientific paper)
 - **Introduction** (half a page)
 - **Background work** (1–2 pages) discusses the science (including references) adds some “*what if’s*” to the facts, and connects it to story.
 - **Fictional Story** (9–10 pages) that illustrates describes and tests (exercises) your vision of the technology and usage.
 - **Summary** (half to one page, say) that provides an overall comment (reflection).
 - **References** included at the end of the paper.

(Note: short SFPs are prorata smaller mirrors of the above).

Some Examples: <http://dces.essex.ac.uk/Research/iieg/CS2011.htm>

μFiction (Micro-Fiction)

Provides quick method to capture the initial idea



6 Word

- ▶ **"For sale: baby shoes, never worn"** – Ernest Hemingway (who, according to science fiction writer Arthur C. Clarke, in the 1920's bet \$10 he could write a complete story in just 6 words, starting this genre!).

- ▶ "Lie detector eyeglasses perfected: Civilization collapses." – Richard Powers
- ▶ **"TIME MACHINE REACHES FUTURE!!!"** – nobody there" – Harry Harrison

- ▶ No agreed specification; Range from 6 to 1000 words; **Popular size 25–30, words** (text message size!).
- ▶ Similarities to *fables, parables, anecdotes, sayings, proverbs* and *maxims*
- ▶ English speaking world called *micro-fiction, nano-fiction, flash-fiction, sudden-fiction* or *postcard-fiction*
- ▶ Around the world called *microrrelato* or *ficcione* (Latin-America); *nouvelles* (France); *minute-long* or *smoke-long* (China); *Haibun* (Japan)

- ▶ Technology based – *Mobile-phone (Ketai) fiction* (160 characters ~30 words); *'Twitter Lit'* (140 characters ~25 words)

- ▶ Examples can be found at

- *Wired* (6-word) - <http://www.wired.com/wired/archive/14.11/sixwords.html>
- *Espresso Stories* (25 words) - <http://espressostories.com>
- *Micro-SFPs* (Twitter-size) - <http://www.creative-science.org/activities/microsfp/>

This is the style Micro-SFPs adopt

Writing a μSFP

Technology oriented story writing?



- ▶ Twitter / SMS sized fiction (140 /160 characters – about 25 words)
- ▶ **Simple writing procedure**
 1. Start by identifying the technology, process or service
 2. Identify a user (use a very short name eg Joe)
 3. Then create a plot (events that make up the story – should include an inflection point)
 - Start big, then reduce it to <140 characters / 25 words

Some aids to promoting the imagination process

The World By 2048?

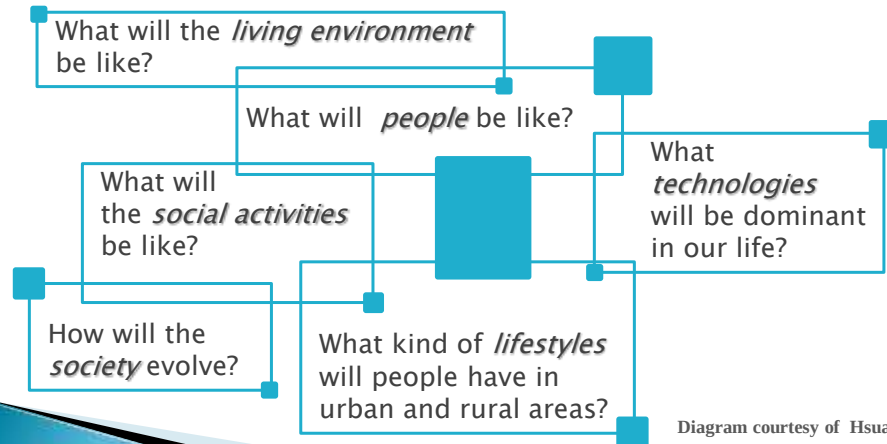


Diagram courtesy of Hsuan-Yi Wu

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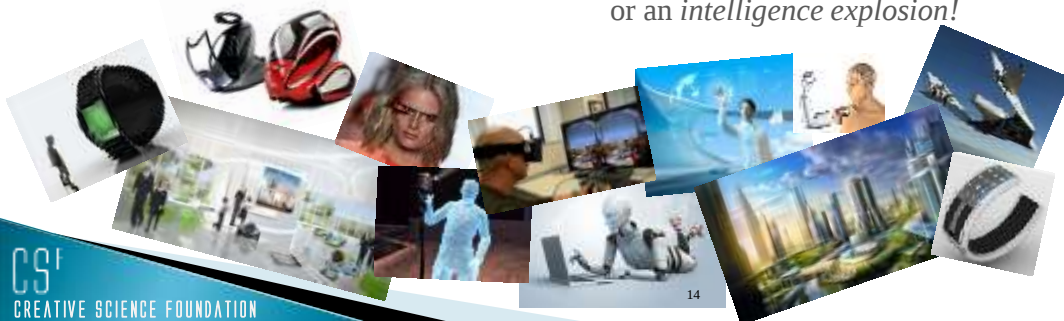
Some aids to promoting the imagination process

The hundred-year problem

- Adam Greenfield (2006) suggested that the failure to realise Mark Weiser's full vision for Ubiquitous computing was because *"It's a technical, social, ethical and political challenge of extraordinary subtlety and difficulty resistant to comprehensive solutions in anything like near-term"*

The Technological Singularity

- ▶ ... the moment machine intelligence exceeds human intelligence (around **2048** according to Kurzweil)
- ▶ ... Might be brought to fruition as outcome of *whole brain emulation, transhumanism* or an *intelligence explosion!*



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Examples – μ SFP (created by 16/17 year-olds in 90 mins)



New Creatives,
Essex, 2014

- ▶ Jack fall asleep in the sun. His **smart sun protection sensor** woke him up with an alarm & soft vibration. He avoids sun strokes!
- ▶ Amy can't diet but her **bracelet** helps stop her eating a naughty treat over a salad. It clamps tight on her wrist & shocks her.
- ▶ OMG where did u get ur coat from? It was the only one left in the store. But I can **3D-print** it 4 u. Thank u so much.
- ▶ With my new **eFridge** I can have my cake & my stay at home. I come home 2 a full stock of food & no court orders for a drunkard.
- ▶ I'll just pop off to get some sushi. Bob established a **wormhole link** to Japan and vanished.

Examples – μ SFP (25 words on the Singularity)



- ▶ **Whole Brian Emulation** – Zoe, you've been my life-long friend on SentiBook; today the news feed reports most social network friends don't exits, are you real? (22 words, 133 characters)
 - Imagines point where AI has ability to masquerade as people, either openly or surreptitiously opening up intriguing, if disturbing consequences for human society and relationships.
- ▶ **Transhumasim** – Tom, this morning mend the cooker, take the kids to play land & go to work. Yes, dear we will do that! (21 words, 101 characters)
 - Raises possibility that spare-part replacement might not just lead to creating single clones of people but multiple identical clones (three in this case allowing John at least three times the amount of work.
- ▶ **Intelligence Explosion** – Jane's sleepy eyes said it all, another smart home with a viral-intelligence infection, call the singularity exorcists! (17 words, 119 characters)
 - explores possibility intelligent environments may be susceptible to super-intelligent viral agents that migrate, evolve and mutate and take on a form of evolving sentient ghost-like presences

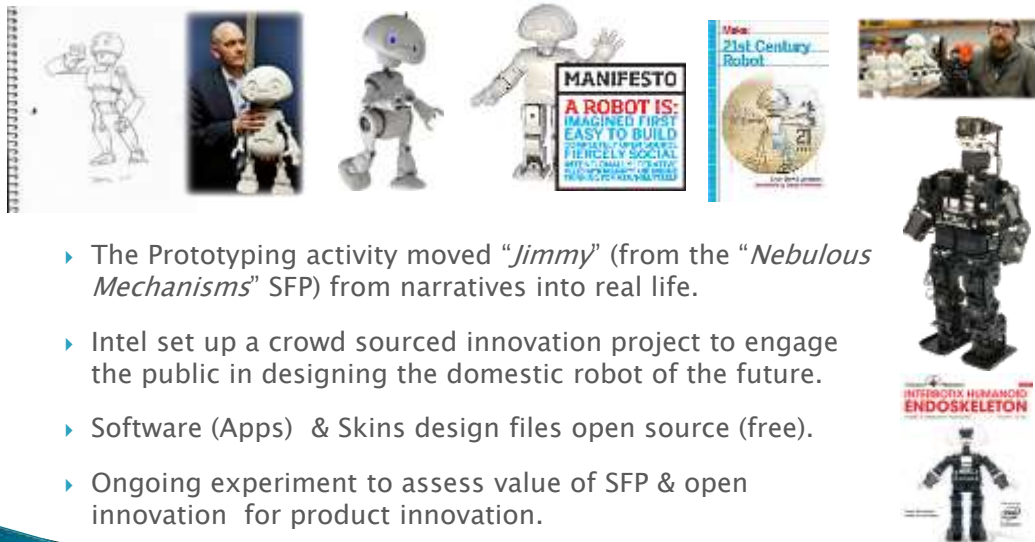


Examples – SFP (Intel's 21st Century Robot)

- ▶ The first SFP, “*Nebulous Mechanisms*”, written by Brian Johnson & presented at IE’09 in Barcelona based on science–fact paper (*Using Multiple Personas in Service Robots to Improve Exploration Strategies When Mapping New Environments*” by Egerton, Callaghan, Clarke).
- ▶ About a robot called Jimmy, and the issues that arose through mimicking the irrational aspects of humans in robots (based on experience of my then PhD student (Simon) who went to Malaysia following a girl he loved and the heartbreak that followed!



Examples – SFP (Intel's 21st Century Robot)



- ▶ The Prototyping activity moved “*Jimmy*” (from the “*Nebulous Mechanisms*” SFP) from narratives into real life.
- ▶ Intel set up a crowd sourced innovation project to engage the public in designing the domestic robot of the future.
- ▶ Software (Apps) & Skins design files open source (free).
- ▶ Ongoing experiment to assess value of SFP & open innovation for product innovation.

Intels 21st Century Robot – News Report

Brian Johnson
Introducing Intel's
21st Century
Robot project on
the 'Wall Street
Journal Live' TV
channel (a
business-focused,
news service
based in New
York City.



VIDEO OF 21ST CENTURY ROBOT INTERVIEW

Examples – SFP (Immersive Displays ImmersaVU)

New Commercial Product

ImmersaVU <http://www.immersivedisplay.co.uk/immersavu.php>



Based 2010 SFP “*Tales From a Pod*” (about education in 2048*)



SFP's are short stories that describe future products and contexts

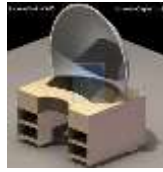
iPods were effectively small cocoons; something like a comfortable armchair enclosed within a sound-proof egg-like structure packed with sophisticated but largely invisible technology that included immersive mixed reality and sophisticated AI. When participating in a movie (the industry had long dropped the word “watching” which describing these new immersive movies) the immersive reality technology aimed to make the participant feel as though they were truly part of a fictional physical world.

[http://dces.essex.ac.uk/Research/iieg/papers/TalesFromAPod\(Paper\).pdf](http://dces.essex.ac.uk/Research/iieg/papers/TalesFromAPod(Paper).pdf)

* The authors are fans of the Chinese film director Wong Kar-Wai

Example SFP – Tales from a pod

The Real Product



<http://www.immersivedisplay.co.uk/>

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The SF-Prototype Specification

Additive Technology ePod-4

In this increasingly competitive world, where knowledge determines success, your child deserves the very best education available and that is Additive Technology's **ePod-4**. Pioneering research by Benjamin S. Bloom in the 1980s (and supported by all work since) proved that students who receive one-on-one tuition learn at least an order of magnitude better than grouped students. If you want to give your child the best one-to-one education in the world, give them an Additive Technology's **ePod-4**.

Education:

- Super-Intelligent Artificial Teachers
- Personalised one-to-one tuition (the gold standard)
- Teacher's avatar has visualisation powers that don't exist in physical space
- Available 24 hours a day, 365 days a year
- Learning environment (avatar, surroundings, lessons) can be tailored for each student
- Unwavering attention and happy disposition
- Compelling content combined with contextual delivery
- Teachers available in different cultures, ages, sexes and form



Technology

- Free-Will 3 © - Quantum processor (upgradable)
- My-Mind 1.2 © - Evolving Persona Engine (customizable)
- Flame 5 © - EmotionWare
- Get Real 8.2 © - Mixed Reality Cocoon
- Real-Touch © iSkin & Haptics
- Ghost 4.1 © - 3D Imaging & Audio
- SentiNet © - Knowledge Engine

Additive Technology, Zizhu Science Park, No. 880 Zi Xing Road, Minhang, Shanghai 200241, China



Example SFP – Tales from a pod

- ▶ The production version of the ImmersaVU used in blended reality research



VIDEO SHOWING MIXED_REALITY DEMONSTRATION OF REALISATION OF TALES OF THE POD SFP

www.FortiTo.com

<http://www.immersivedisplay.co.uk/immersavu.php>

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Alternative Applications of SFP (Chinese examples)

- ▶ **Dali Cashmere** – High-tech manufacturer of cashmere using ideas from ‘Transformers’ to create a flexible production facility 8 times more productive than competitors.
- ▶ **Sunfed Fashion** – top selling professional women's fashion-wear uses SF/Fantasy to inspire new designs embedded in popular culture (which aids marketing).
- ▶ **Tsinghua University Press** introducing SFP book for teaching technical English with computer system architecture..



Owner of Dali Cashmere with “Big-Brother” inspired global operations monitoring



Frankenstein – the monster's long coat



The “Great Chinese Bake-Off” (example of product innovation from pre-publication trial)



Future Facts: a 1976 book of extrapolations

- ▶ **300 examples** of existing work that are extrapolated forward 25 years (*unlike SFP, this book didn't test these ideas by setting them in stories*).
- ▶ **People Washer Egg** (Sanyo Electric Co) – fifteen minute cycle of warm shower warm shower, ultrasonic washing, whirl water cleaning with small rubber balls to massage skin and muscles & hot air drying – **not happened yet!**
- ▶ **Telenet** – data communication system, used by Pentagon's Advanced Research Projects Agency (ARPA) to link 18 cities – **became the Internet!**
- ▶ **System 80 Learning Machine** (Borg-Warner) – acts like private tutor (two feet square, console containing a record player, screen, row of buttons, and memory bank) – **became eLearning!**



In contrast to trying to forecast the future, SFP concerns futurecasting (making the future!)



Some Upcoming Events (with a creative science thread)

Technology, Innovation,
Entrepreneurship & Education
2016 (TIE'16) – Canterbury
8–9th September 2016



Intelligent Environments 2016 (IE'16) –
London 12–16th September 2016

Immersive Learning 2016 (iLRN'16) –
Santa Barbara 27th June–1st July 2016



Summary

- ▶ SFPs provide a tool to capture, test communicate digital innovation ideas.
- ▶ The key principle is to combine science fact with science fiction so as to inject imaginative leaps, through exploration of '*what if*' possibilities in an engaging and credible way.
- ▶ Outcomes can be new digital services and, products or, go beyond just technology to new business or socio-political structures.





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That's it !

"How do we change the future?"

Change the story people tell themselves about the future they will live in"

Brian Johnson

"We are what we pretend to be, so we must be careful what we pretend to be?"

Kurt Vonnegut



"The real source of wealth and capital in this new era is not material things.. it is the human mind, the human spirit, the human imagination, and our faith in the future" Steve Forbes.

"It's really hard to design products by focus groups. A lot of times, people don't know what they want until you show it to them." Steve Jobs

<http://victor.callaghan.info>

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