

Pushing **optics and photonic ideas** into **innovation through crowdfunding**

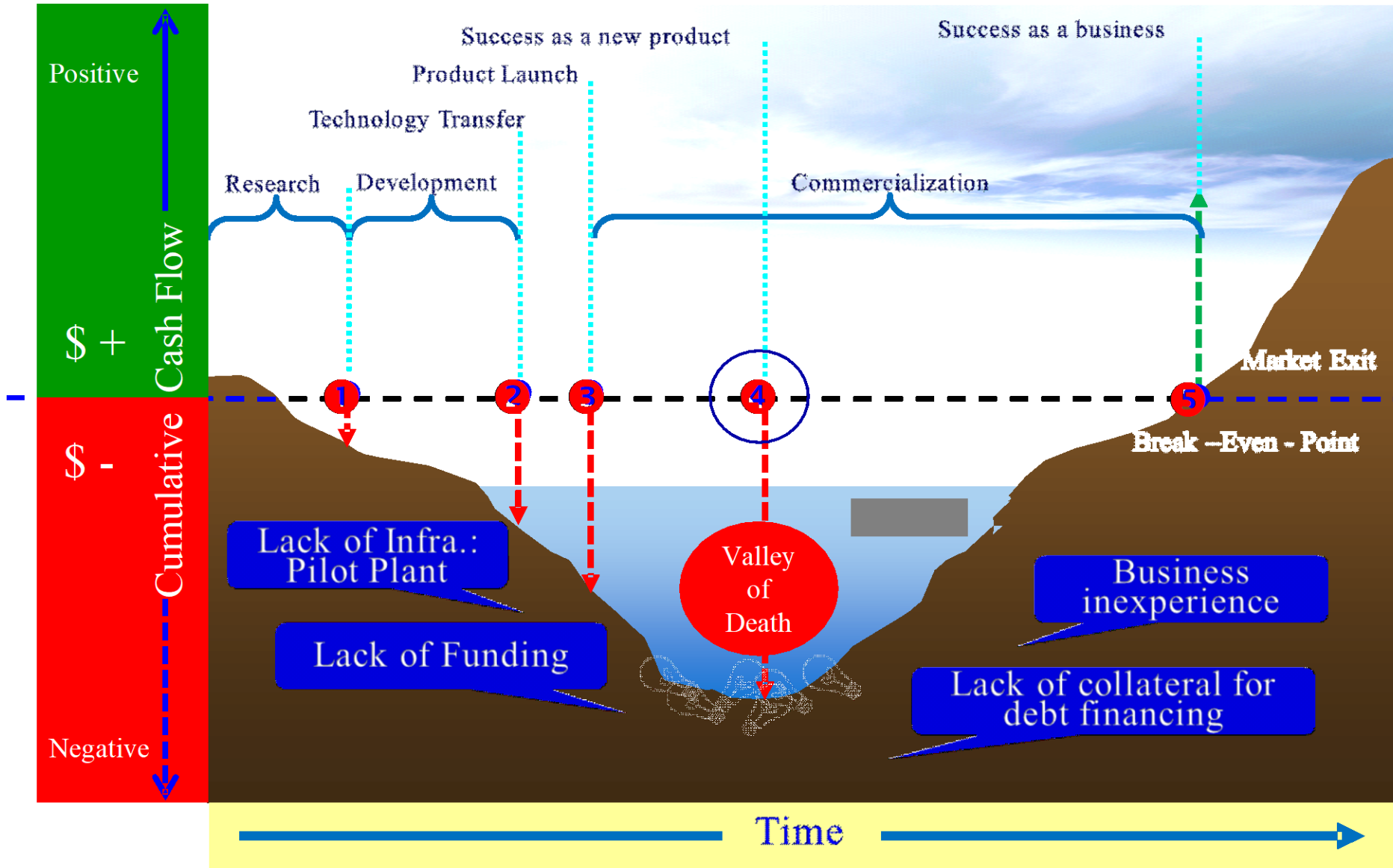
Sarun Sumriddetchkajorn

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National Electronics and Computer Technology Center (NECTEC)
National Science and Technology Development Agency (NSTDA)
Ministry of Science and Technology

Email: sarun.sumriddetchkajorn@nectec.or.th

Crossing the "Valley of Death"



Adapted from source: Osawa and Miyazaki, 2006

No Tool

No Equipment

No Help

No...

No...

No...

No Funding

Ask yourself “do you want to do it or not?”

See your environment on what it can give you...

*Electronic Shops, Machine Shops, Internet, Stationary,
National S&T Infrastructure, MATLAB [OCTAVE, KNIME
(AI)],...*



<https://econsultancy.com/best-charity-marketing-campaigns-2017/>



Power of Crowd

NECTEC



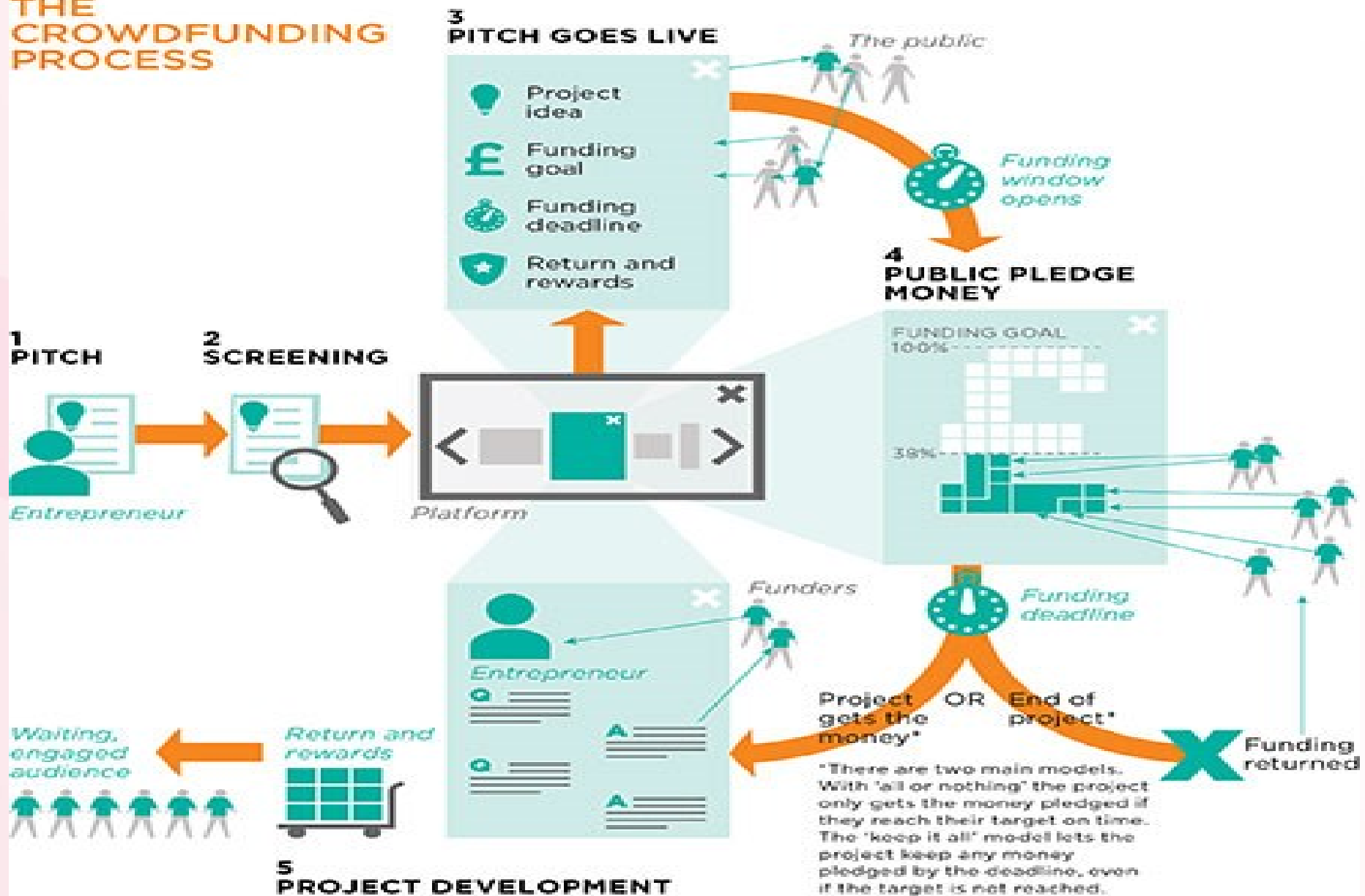
X

Omnichannel Communications
(online + offline)

What will you learn?

- *Fundraising*
- *Market Survey*
- *Technology/idea Survey*
- *Project Management*

THE CROWDFUNDING PROCESS

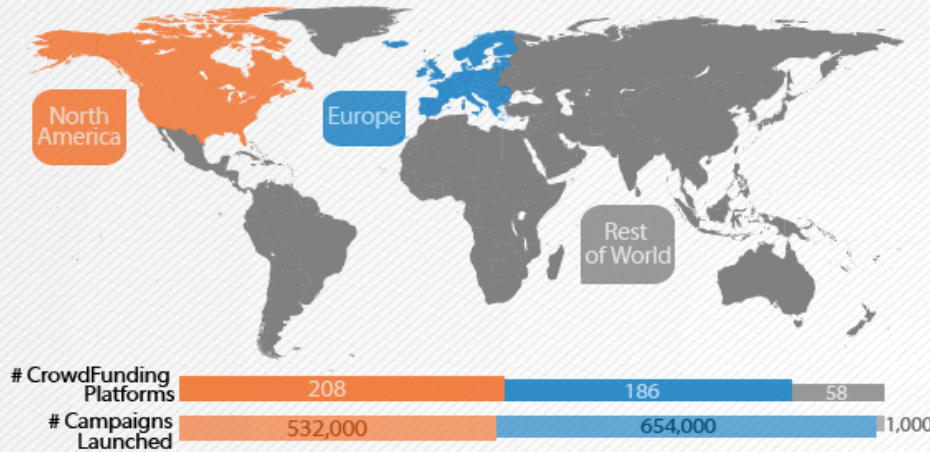


MONEY FROM THE CROWD

brought to you by
SeedingFactory.com

sources (sept 2012)
crowdsourcing.org
kickstarter.com

CrowdFunding activity in the world



\$1,5 B
raised worldwide

+90%
expected growth in 2012

Canadian Top Funding



JOBS Act overview

Timeline

April 2012: Signed by Obama

January 2013: Goes into effect

Rules for Start-up

Can sell up to **\$1 M of stocks** a year to unlimited investors.

Rules for Investors

<\$100K: max **\$2000/year**

>\$100K: max **10% of income**

The **JOBS Act** signed by the US is a strong driver

Equity-based model is the less common but most promising one.

+300% growth in 2012

KICKSTARTER USA

USA

indiegogo USA

USA

KIVA USA

USA

PROSPER USA

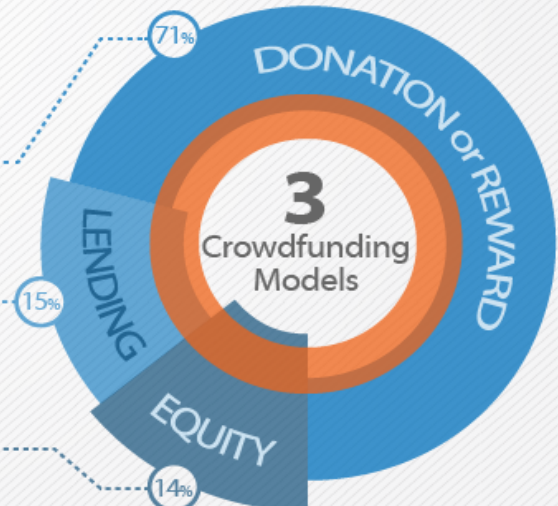
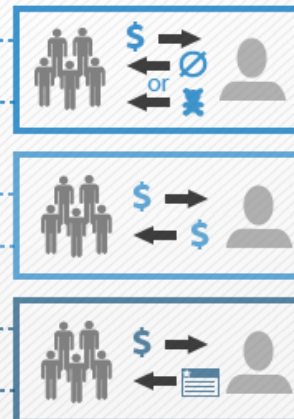
USA

crowdcube UK

UK

WISEED

participer financement France



The screenshot shows the Indiegogo website interface. At the top right, there is a navigation link "EXPLORE INDIEGOGO". The main navigation bar includes the Indiegogo logo "INDIEGOGO for Entrepreneurs", menu items "How it Works", "Resources", "Stories", and "About Us", a prominent pink "START A CAMPAIGN" button, and links for "Sign Up" and "Log In". The central content area features a headline: "Project by project, we're changing the way new ideas come to life." Below this, four statistics are presented in a grid format, each with a large pink number and a descriptive sentence. The statistics are: 1B+ Total raised across all projects, from dance to design; 11MM+ Contributions from our amazing community of backers for 650k+ projects; 223 Countries & territories where campaigns have started; and 18,983% The most a campaign has exceeded its goal ... so far! The page is accessed on Jan. 28, 2019.

EXPLORE INDIEGOGO

INDIEGOGO for Entrepreneurs How it Works ▾ Resources ▾ Stories About Us ▾ **START A CAMPAIGN** Sign Up Log In

**Project by project,
we're changing the way new ideas come to life.**

1B+ Total raised across all projects, from dance to design.	11MM+ Contributions from our amazing community of backers for 650k+ projects.	223 Countries & territories where campaigns have started.	18,983% The most a campaign has exceeded its goal ... so far!
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Accessed: Jan. 28, 2019.

\$4,089,586,411

total dollars pledged to Kickstarter projects

157,124

Successfully funded projects

15,705,926

Total backers

5,121,430

Repeat backers

50,641,755

Total pledges

KICKSTARTER

NER

Projects and Dollars

Category	Launched Projects	Total Dollars	Successful Dollars	Unsuccessful Dollars	Live Dollars	Live Projects	Success Rate
All	431,821	\$4.09 B	\$3.65 B	\$422 M	\$18 M	2,938	36.64%
Games	42,713	\$953.84 M	\$876.92 M	\$71.01 M	\$5.92 M	373	37.83%
Design	35,545	\$896.74 M	\$815.04 M	\$77.73 M	\$3.97 M	275	36.73%
Technology	37,389	\$794.13 M	\$694.80 M	\$95.83 M	\$3.50 M	268	20.21%
Film & Video	69,874	\$426.31 M	\$360.77 M	\$64.90 M	\$638.14 K	286	37.37%
Music	58,358	\$227.25 M	\$207.54 M	\$19.02 M	\$692.17 K	252	49.65%
Fashion	27,163	\$162.42 M	\$142.37 M	\$19.40 M	\$657.99 K	263	26.30%
Publishing	44,889	\$154.69 M	\$135.31 M	\$18.75 M	\$623.38 K	317	31.92%
Food	27,417	\$144.92 M	\$122.10 M	\$22.35 M	\$468.41 K	165	25.06%
Art	32,749	\$106.81 M	\$95.09 M	\$11.26 M	\$459.50 K	367	42.23%
Comics	13,085	\$88.80 M	\$82.82 M	\$5.58 M	\$405.91 K	134	56.74%
Theater	11,588	\$43.33 M	\$38.71 M	\$4.53 M	\$97.29 K	49	59.79%
Photography	11,637	\$43.14 M	\$37.79 M	\$5.29 M	\$62,655	46	31.42%
Crafts	10,093	\$17.22 M	\$14.13 M	\$2.97 M	\$117.75 K	100	24.47%
Journalism	5,274	\$15.91 M	\$13.76 M	\$2.08 M	\$64,989	35	22.05%
Dance	4,047	\$14.06 M	\$13.08 M	\$969.32 K	\$9,030	8	61.82%

Accessed: Jan. 28, 2019.

Typical Crowdfunding Models

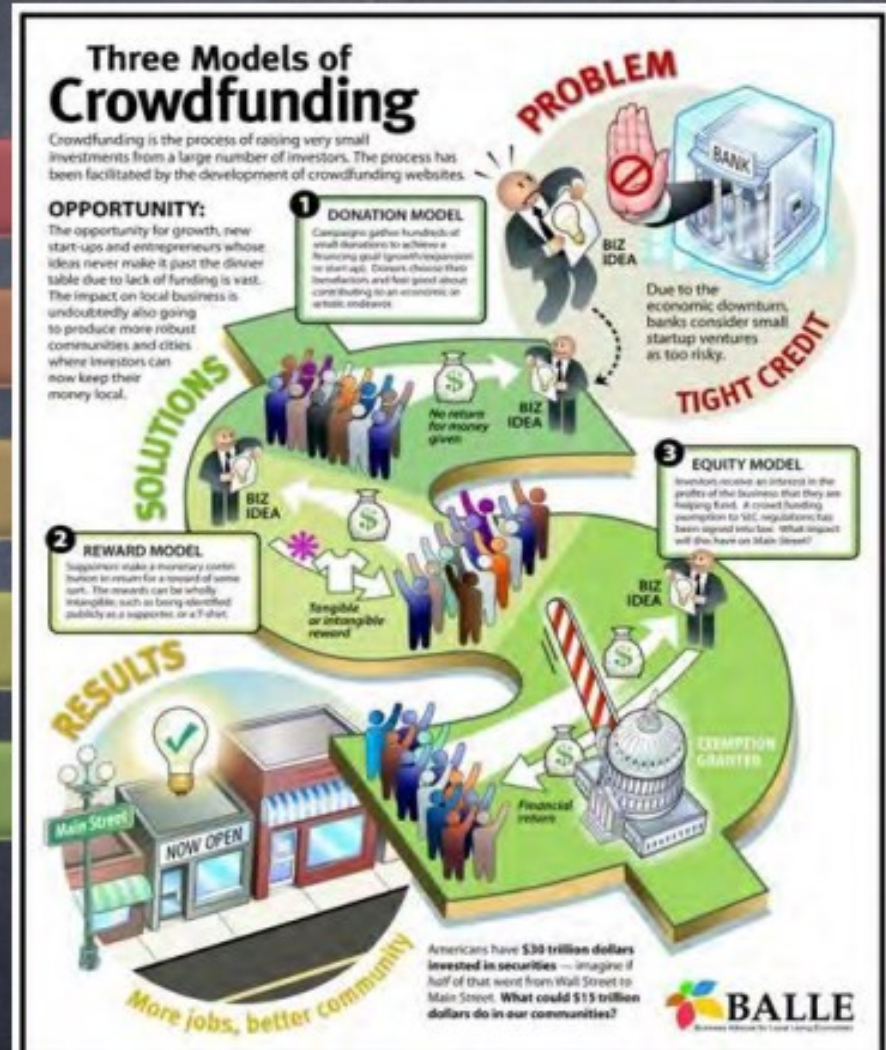
Gift Based

Reward Based

Donation Based

Lending Based

Equity Based



Crowdfunding: Examples of great success



KICKSTARTER



Jolla Tablet - world's first crowdsourced tablet

Be a part of making the world's first people powered tablet, running Sailfish OS 2.0.

\$2,162,063 USD

InDemand



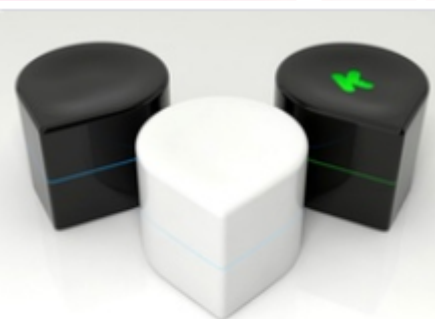
Ritot - the first projection watch.

Inspired by future technologies we wanted to...

with Smart Crowdfunding

\$1,610,151 USD

InDemand



The Mini Mobile Robotic Printer

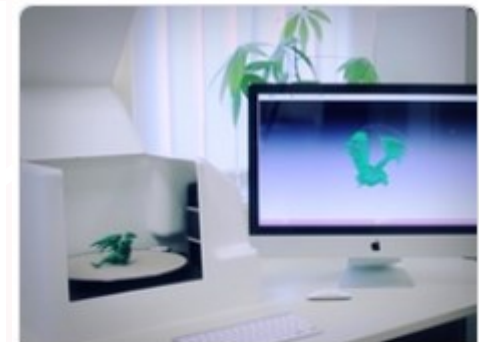
ZUta Labs Ltd.

Finally! Mobile printing is really here! A printer that goes where you go & prints from your phone on any size page! The future is now!

Jerusalem, Israel

Successfully funded!

127% funded **\$511,662** pledged **Funded** May 10 2014



Desktop 3D Scanner

CADScan

An easy-to-use, low-cost 3D scanning system that captures full colour, accurate 3D object data in minutes.

Chester, UK

Successfully funded!

121% funded **£97,264** pledged **Funded** Mar 19 2013

no time for chit chat the world awaits my glory!



2011 AFTER MUCH DELIBERATION PEBBLE IS BORN

2012

Pebble: E-Paper Watch for iPhone and Android

by Pebble Technology



68,929

backers

\$10,266,845

pledged of \$100,000 goal

0

seconds to go

Funded!

This project was successfully funded on May 19, 2012.

April 12 update - We're absolutely blown away by your support, Kickstarter. \$1M in 28 hours!

2015 Pebble Time - Awesome Smartwatch, No Compromises



Pebble Time - Awesome Smartwatch, No Compromises

\$20,338,986

pledged of \$500,000 goal

📍 Palo Alto, CA 🛠️ Product Design

Make It Happens

Examples of Photonic Ideas on Crowdfunding

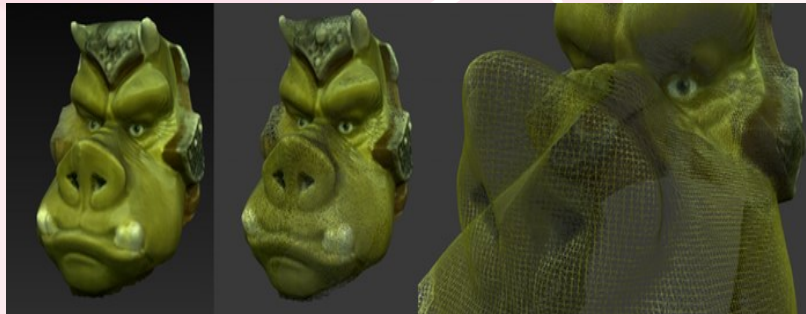
Ideas

Prototypes

Products (Version xx)

Tech spec, Fund needed, What to offer

3D Optical Scanner (good for small 8x6-inch² object)



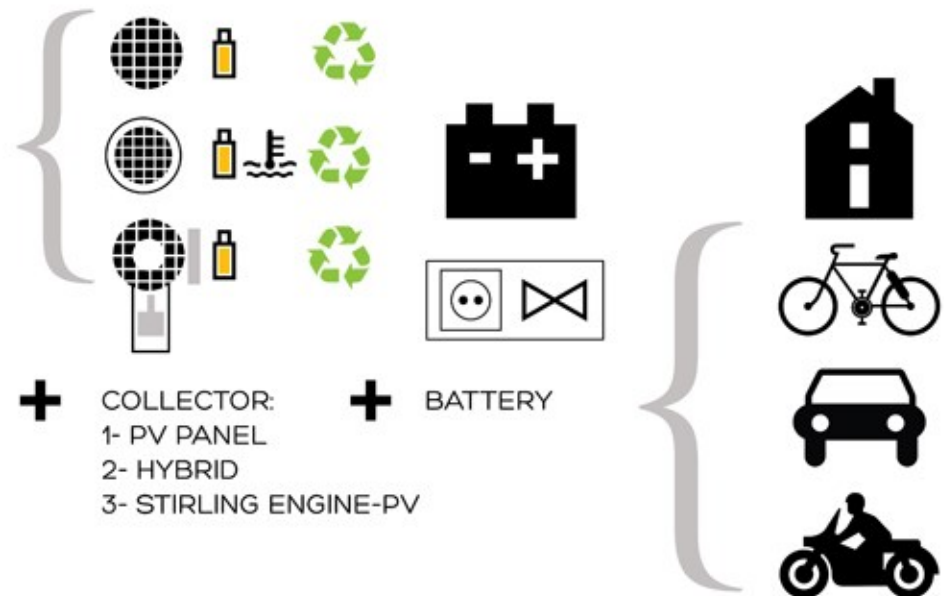
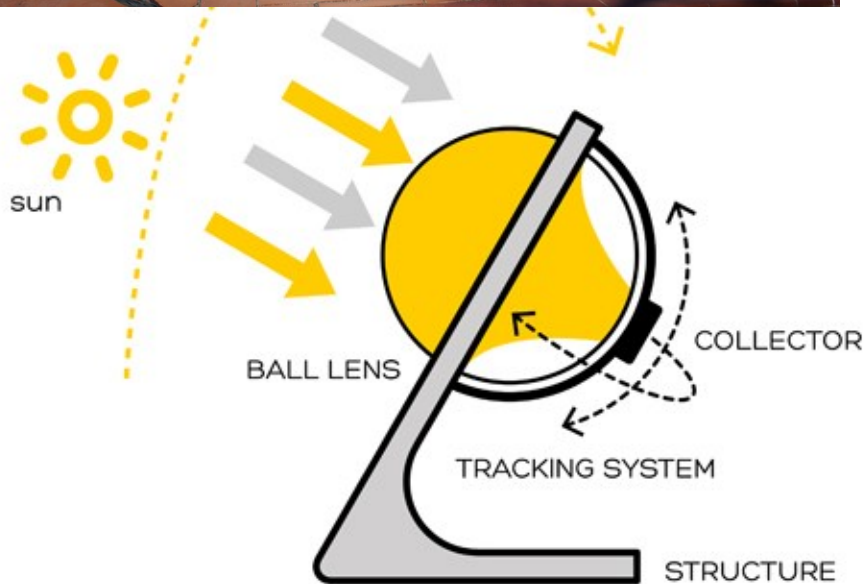
End: USD219,996

Concept: Sheet of light beam, Mechanical rotation, Image processing, Electronics

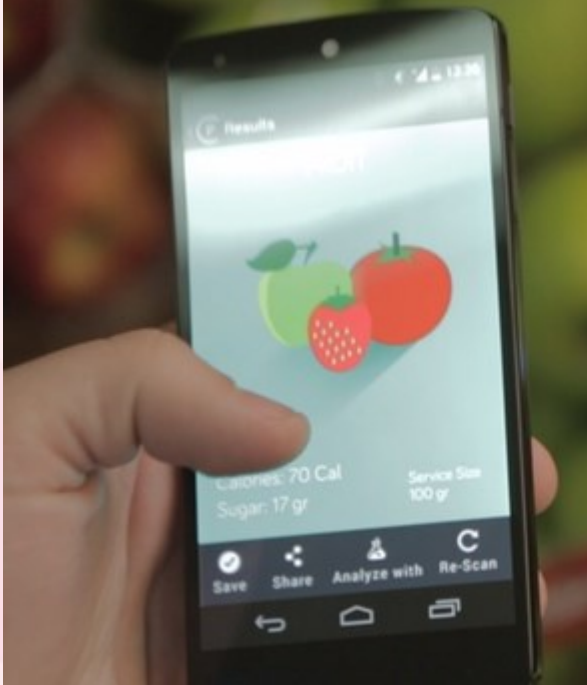
Solar Charger

Concept: Concentration of Sun light on a small solar cell, Mechanical rotation, Electronics

End: USD230,668



Portable NIR Spectrometer



Illumination	Wide-Band NIR , Eye Safe
Sensor	Near IR Spectroscopy
Measuring Time	1-2 sec
Measuring Distance	0-20 mm
Connectivity	Bluetooth 4.0 Low Energy
Battery	One Week Use Charged via micro USB

End: USD2,762,571

Portable Raman Spectrometer



End: USD386,392

Spectroscopy	Raman (600 to 1600 cm^{-1})
Laser	Class 3A (5 mW)
Detector	512 × 12 bit at 20 Hz
Battery	Internal Lithium Battery (rechargeable via USB)
Connection	Bluetooth 4.0 LE
Physical Dimensions	8.5 cm × 5.5 cm × 1.6 cm $3 \frac{3}{8}'' \times 2 \frac{1}{8}'' \times \frac{5}{8}''$
Weight	80 g (3 oz.)
OS Support	Android, iOS
Colors	White, Red, Green, or Turquoise Blue

Note: These specifications are subject to change during the development process.

<https://www.indiegogo.com/projects/dual-microscope-lens-for-mobile-devices-twi-vis#/>
<https://www.youtube.com/watch?v=YIHtMQZ3xiM&feature=youtu.be>

Dual microscope lens for mobile devices: TWI-VIS

📍 Bangkok, Thailand 📄 Technology

Story | Updates 0 | Comments 29 | Funders 100

1.2k

Share

32

Tweet

11

8+1



Email



Embed



Link



Follow



\$6,424 USD

RAISED OF \$5,000 GOAL

128%

⌚ 0 time left

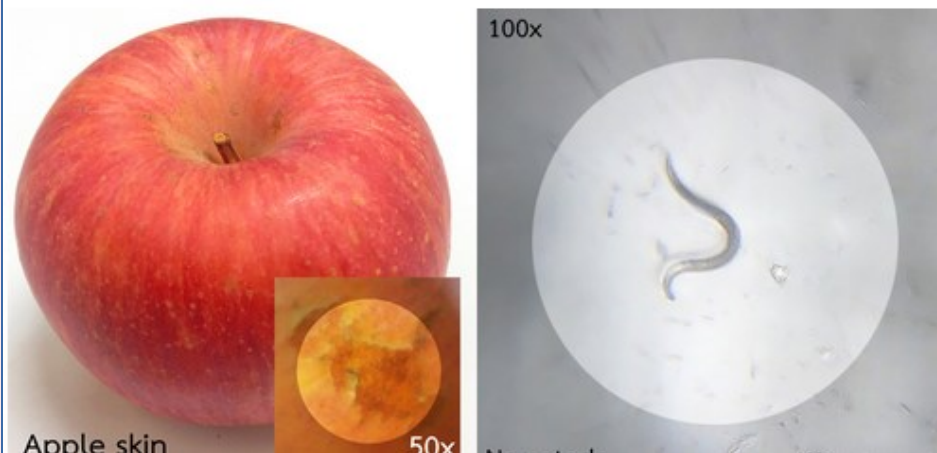
This campaign started on Dec 11 and closed on January 10, 2015 (11:59pm PT).

🎯 Fixed Funding ?

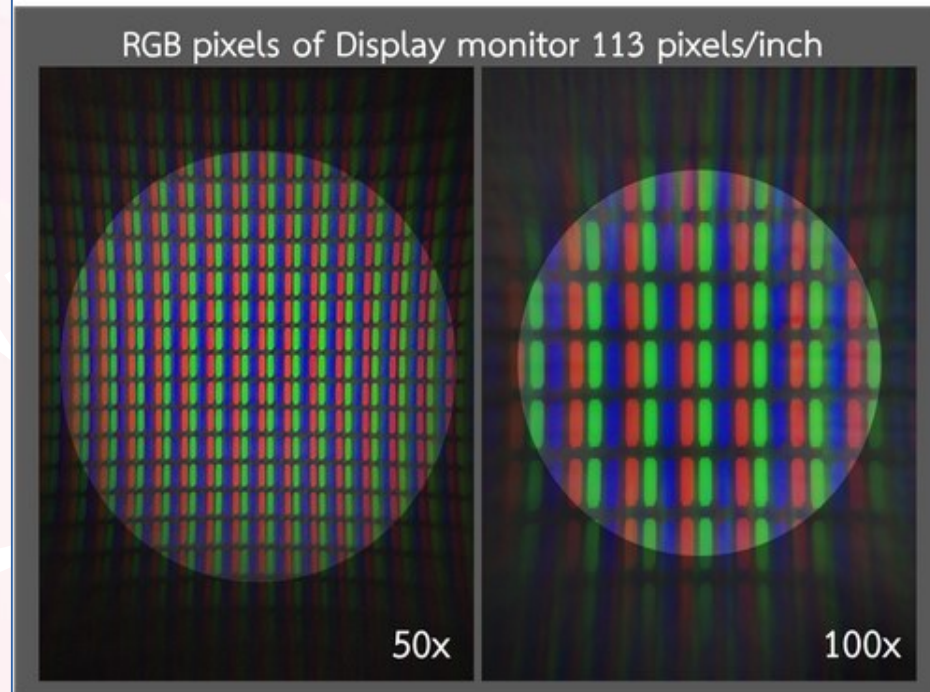
CAMPAIGN CLOSED

This campaign ended on January 10, 2015

Have you ever wondered how small creatures look like? Need a microscope? What about seeing the micro-world with your cell phone or tablet?



Here, we offer TWI-VIS, a dual microscope lens which has **two magnifications (50x/100x) in a single piece**. Then, you can enjoy both in just one order!!



A dual microscope designed in a trillium-like shape can be easily stuck on both front or back camera. Also, it comes off without leaving any residues. Whatever devices you have, cell phone or tablet, the TWI-VIS works well with any smooth surface.

\$19 USD

Early bird - TWI-VIS with case

Early bird TWI-VIS 50/100x lens with case. Free economy International shipping worldwide.
Get one before it runs out!!

We do appreciate that you decided to use this lens as the New Year gift. Only for the backer who backs before 15DEC2014, we will ship the package on 16DEC2014. Please add \$20 more for EMS option, it normally takes 3-4 days depending on countries. Please check with us if you need more info.

SOLD OUT

\$29 USD

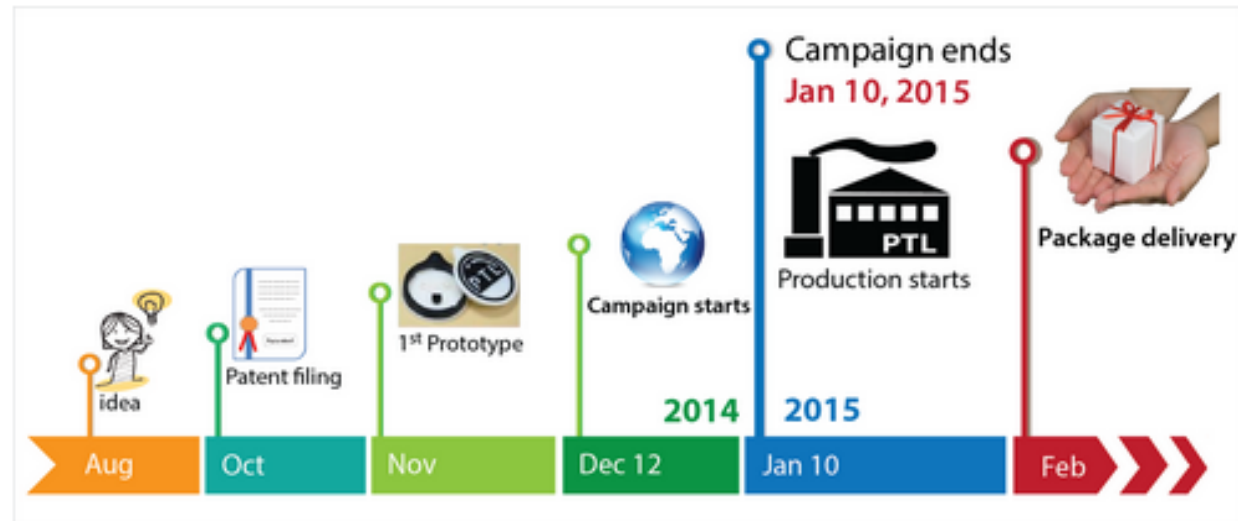
TWI-VIS with case

TWI-VIS 50/100x lens with case. Free economy International shipping worldwide.

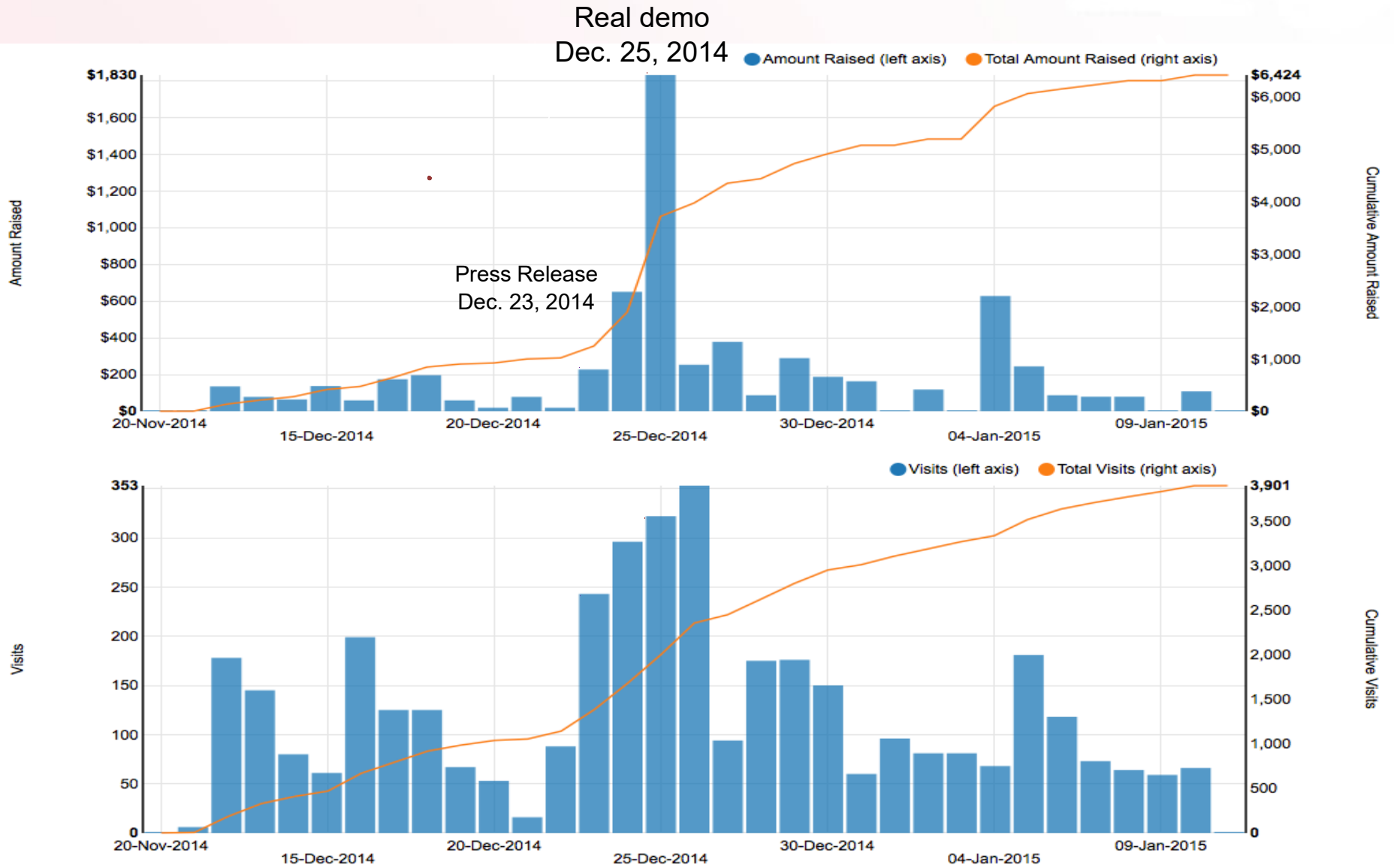
Estimated delivery: **February 2015**

28 claimed

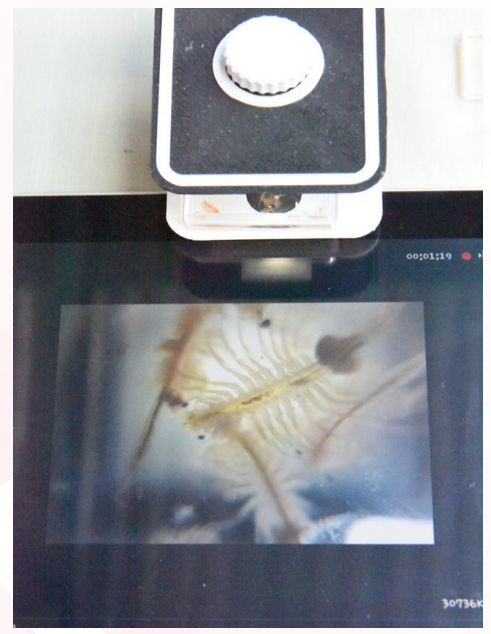
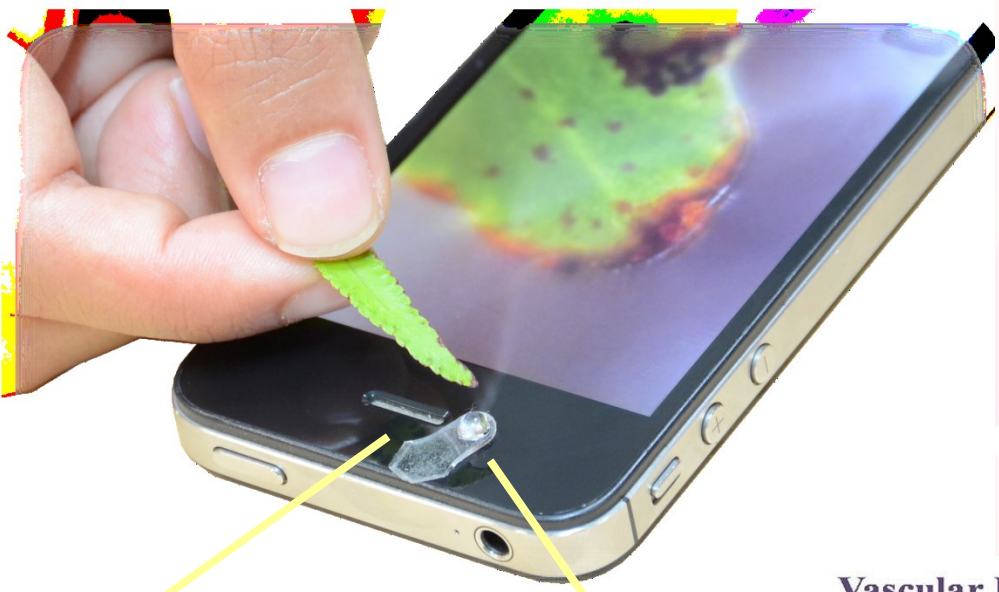
Timeline



Examples of Stimulation







25, 50, 100 and 250x

Vascular Bundle: Xylem and Phloem

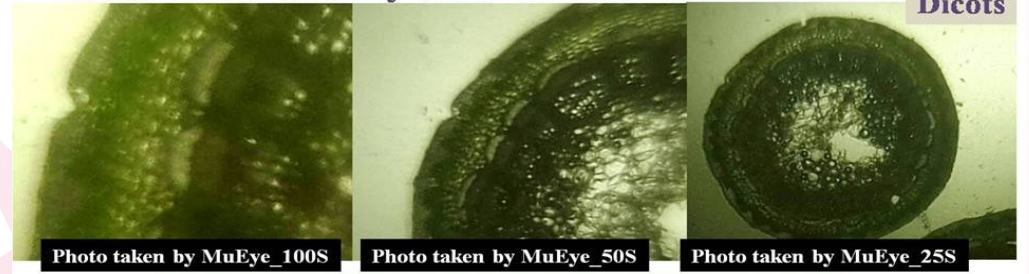


Photo taken by MuEye_100S

Photo taken by MuEye_50S

Photo taken by MuEye_25S

Rose stem in cross section: ภาพตัดขวางของลำต้นกุหลาบ

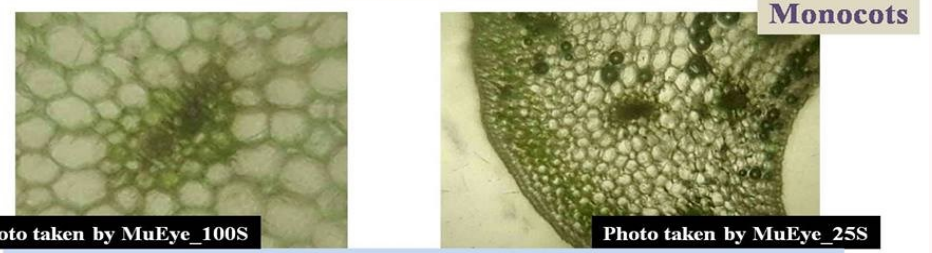


Photo taken by MuEye_100S

Photo taken by MuEye_25S

Golden Pothos stem in cross section: ภาพตัดขวางของลำต้นพลูด่าง

- Patented
- R. Amarit, *et.al.*, *PLOS ONE*, DOI:10.1371/journal.pone.0146414, Jan 2016.

Creating Social Media Community

https://www.facebook.com/pg/MuEyeLens/posts/?ref=page_internal


MuEye. หน้าหลัก 1 7

เพจ กล่องข้อความ การแจ้งเตือน 8 ข้อมูลเชิงลึก เครื่องมือการเผยแพร่ การตั้งค่า ความช่วยเหลือ

ถูกใจแล้ว กำลังติดตาม แชร์ ... ติดต่อเรา

MuEye. ได้เพิ่มงานกิจกรรม
10 กรกฎาคม เวลา 15:58 น. · 🌐

กิจกรรมค่ายบูรณาการวิทยาศาสตร์และเทคโนโลยี
ในเขตพื้นที่จังหวัดยะลา



อ. 24 ก.ค.
กิจกรรมเรียนรู้เทคโนโลยีมิวอาย
บ้านวิทยาศาสตร์สิรินธร · Khlong Luang
👤 คุณถูกใจ MuEye. ★ สนใจเข้าร่วม

เข้าถึง 98 คน การโปรโมทไม่พร้อมใช้งาน

Nattakorn Hemsanit
25 เมษายน เวลา 11:20 น. 🌐

ดูวิดีโอ

ถูกใจ 2 คน
ถูกใจ · แสดงความคิดเห็น · ส่งข้อความ

Samrit Maksong
8 กันยายน 2017 เวลา 16:15 น. 🌐

MuEye

ถูกใจ · แสดงความคิดเห็น · ส่งข้อความ

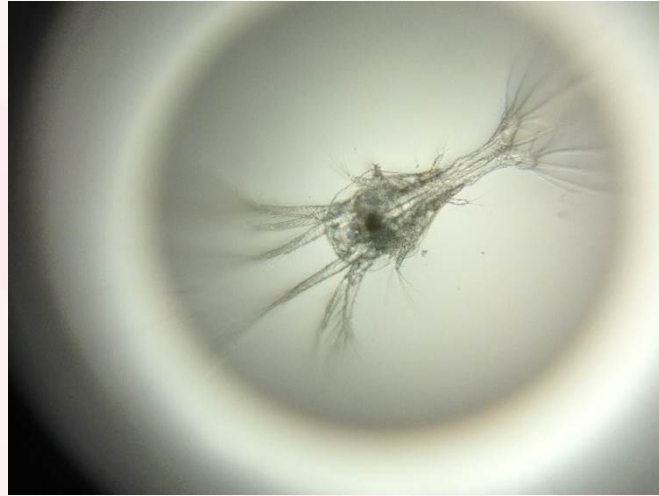
ยุพิน แสงยอด
21 สิงหาคม 2017 เวลา 15:58 น. 🌐

ถูกใจ · แสดงความคิดเห็น · ส่งข้อความ

ภาษาไทย · English (US) · 日本語 · Español · Português (Brasil) +

MuEye.
@MuEyeLens

- หน้าหลัก
- เกี่ยวกับ
- รูปภาพ
- รีวิว
- วิดีโอ
- งานกิจกรรม
- โน้ต
- โพสต์
- บริการ
- ร้านค้า
- ข้อเสนอ
- งาน
- ชุมชน

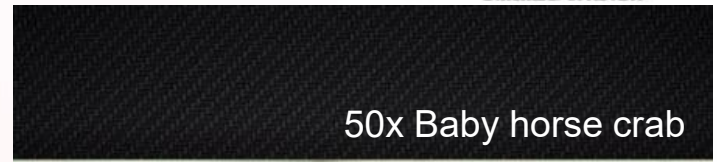




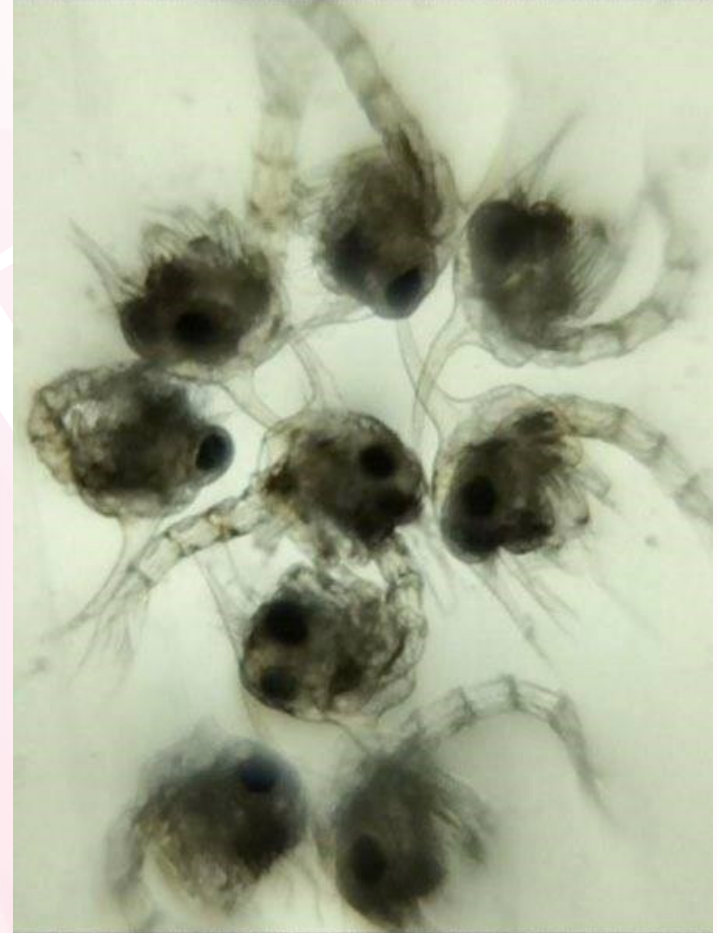
Hydra



25x Baby shrimps in eggs



50x Baby horse crab



https://www.facebook.com/pg/MuEyeLens/posts/?ref=page_internal

250x Human Breast Milk



https://www.facebook.com/pg/MuEyeLens/posts/?ref=page_internal

From the images or videos, you can move forward to...
do (program) image/ video analytics

- **Counting particles or objects**
- **Measuring shapes**
- **Checking specific image areas**
(objects under interest and the surrounding areas) for the desired purposes



Then sends some feedback signals to you (your system) to do some tasks

Spin-off Company in 2016

https://www.muiset.com

... ☆

↓ ≡ 📄 ☰



HOME SHOP OUR STORY CUSTOMER SERVICE



INNOVATE
WITH
INSPIRATION

Patent Pending, 2019



We are preparing to promote it through a crowdfunding

S. Sumriddetchkajorn and Y. Intaravanne, *Applied Spectroscopy*, Vol. 66, No. 10, pp. 1156–1162, October 2012.

MuSpectra: *Mobile Optical Spectrometer*



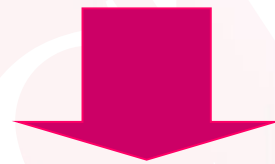
- Operating Wavelength: 400-700 nm
- Light sources: LED white light
- Power consumption: 3VDC, 20 mA
- Accessory magnetic attachment modules:
 - ❑ Two-channel transmission
 - ❑ Two-channel reflection
 - ❑ Fiber-optic port

Killer Apps are needed to make people realize the impact of this creative device

Conclusion

*Now, no matter where you are...
it is time to motivate yourself and push
your ideas into innovation*

Well known typical “crowd donation” + Internet



Crowdfunding

- New platform to spread your idea
- New channel to demonstrate your prototype
- New way to do market survey
- New window to receive fund

and Move Forward

Acknowledgement

- **Photonics Technology Lab**
- **Image Processing Lab**
- **Machine Vision Lab**
- **Optical Thin Film Technology Lab**
- **Business Dev and Tech Transfer Div**
- **Research Support Office Div**
- **Int Cooperation & PR Div**