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# NewSpaceConnect

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Ideation Session

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This document is the physical repository of the co-design process. It will be iterated and shared every time we develop new insights on the preparation of the session.

Its main purpose is to constantly make sure we remain aligned and to trigger new conversations. Our approach is about bringing people together to create something unique.





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# Business Cards

Participants were asked to find someone in the room they didn't know, or would like to know better, and complete the business card template on their behalf:

Business Cards

Andrew Dempster  
Director of ACSEr

being free kangaroo sat on his lap  
free

Business Cards

Ben  
PhD student, ACSEr

accepting engineering, software

Can tell alphabet backwards

Networking find out what everybody's expecting  
gotten Australia.

Business Cards

Ed  
- HANOU -

- 4th year engineering student (1st year) -  
- 4th year engineering student (1st year) -  
- 4th year engineering student (1st year) -

- 4th year engineering student (1st year) -  
- 4th year engineering student (1st year) -  
- 4th year engineering student (1st year) -

Business Cards

Hiranaya  
CTO

Sketches, Drawing.

Hates 9-5

Networking, keeping up to date

Business Cards

Eamonn Glennon  
ACSEr UNSW

GPS receivers for cubesats

Born in South Africa

Came up with something great

Business Cards

Gravin  
UNSW PHOTOGRAPHICS

OPAC POWER SYSTEMS/COMPUTATIONS/PUBLIC

ENJOYS KAYAKING -

MEETINGS.

Business Cards

Trent McDougall  
SPACE BUSINESS IMPROVEMENT

ENJOY RAPIDLY PROTOTYPE

STRANGE SUITS.

NETWORKING OPPORTUNITIES

Business Cards

Stuart McAndrew  
CFO/co-Founder Picosat Systems

Founded one startup. Understands working with disparate systems.

hit in the head with on average a kid.

See other people's ideas

Business Cards

JANNEKE KINTSONEN  
To do - founder

Founder, connector, creative, real

enjoying

Heider Everything

Business Cards

Keith  
Cognitive Space

Electronic, remote, adaptive (AI/ML)

Happy bear

Tangible outputs.

Business Cards

Sean  
UNSW ACSEr

EXC(GEN)

Sean likes #1's.

Collab opportunities.

Business Cards

Kirby Ikin  
Managing Director, Airside Aerospace Consultants

founder of a number of start-ups 10+ years experience founder 2500+ projects

Used to play in Rock Band.

Business Cards

Morgan  
dept. of teaching.

- 1st year of 1st year  
- How to link "education" up.

Business Cards

TIM PERKINS  
1st year of 1st year  
1st year of 1st year

1st year of 1st year  
1st year of 1st year

1st year of 1st year  
1st year of 1st year

Business Cards

DANIELLE NEALE  
ENTREPRENEUR W/REVENUE GROWTH

SALES

ALL KIDS ARE TALLER

?





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# Introduction



## Context

In conjunction with the ACSER conference, we hosted an ideation session, to brainstorm solutions to 6 problem statements, which potentially will result in a FlashBuild in space.

We are focused on providing the support to help commercialise research, foster innovation and knowledge exchange.

The objectives of this program are:

- TechVouchers to support industry and UNSW collaboration
- Other larger funding opportunities like CRC-P's
- New connections and friendships developed while building the NewSpace Ecosystem
- Amazing marketing and PR opportunities for all who participate
- Grow the regional start-up sector and create innovation clusters across the State

## Problem Statements

- We are looking for an out-of-the-box idea for an experiment to run this October during a 5km rocket launch test. We would love to include an industry partner who has never thought of being to space before! Maybe our farmers from FarmConnect?
- We would like to explore centralised ground control and other shared services for cubesats. We are interested in which protocols would be considered best practice for this if legacy ones could be abolished for both data and security optimisation.
- How can we use AI in the predictive maintenance of satellites? Are there lessons to be learnt from other utility industries and super computers like IBM's Watson or UNSW's Silicon Quantum Computing . Will this lead to more divergent designs for special use satellites or a one size fits all design?
- We want to put a blockchain mining rig in space to mine coins. We know this may not make too much sense, but that's what a flash build is all about. We can use this as a metaphor to explain computers in space, cyber security, photovoltaics and other great Australian made technologies!
- We are really interested in getting a legal and philosophical point of view on the militarisation of space. Currently, the US is pulling out of policies and accords and looking to make a Space Force. What are the risks and ramifications of this becoming the next battlefield?



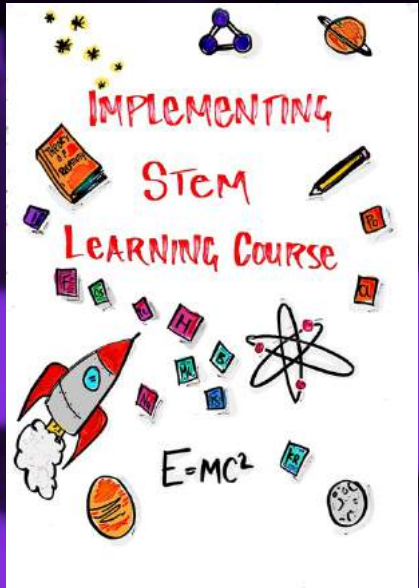




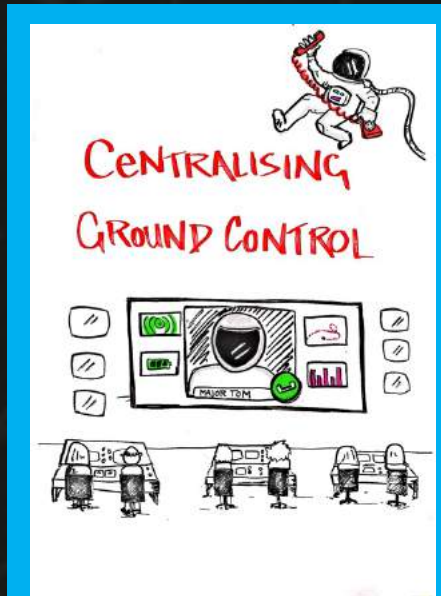
# Problem Statements

Introducing our 5 problem statements to bring the challenge to life

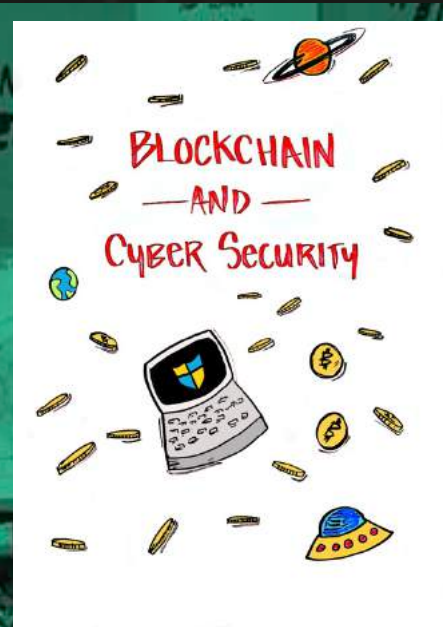
1



2



3



4



5









# Individual Perspectives

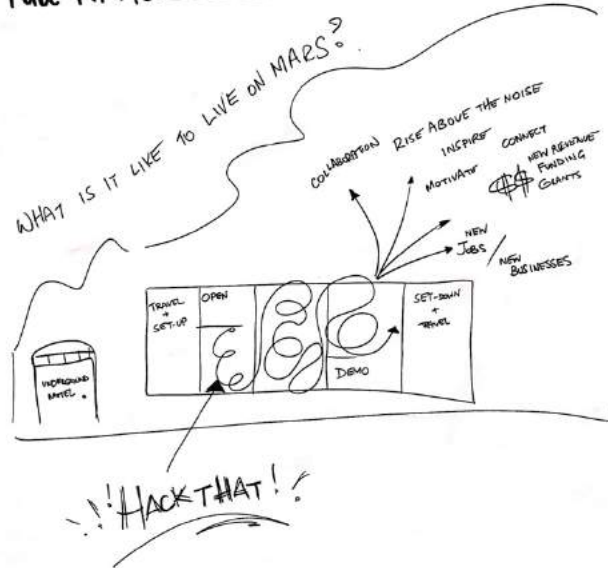
After we provided the program objectives, and the context, we asked participants to define their perspective of success, and how they saw their role in this opportunity

1

2

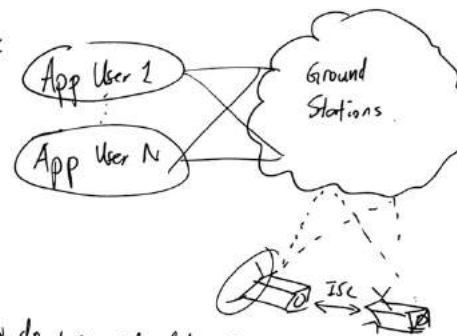
3

Full NAME Danielle



Full NAME Joan Cheong


Problem:



How do we get data from multiple spacecrafts centralized and App Users?

How do we make use of Interstellite Link (ISL)?

Full NAME TIM PARSONS

SELF-SUFFICIENT   
MOONBASE / ~~HOPKIN~~ SCHOOL

- LIVEABLE
- FOOD/AIR/WATER/POWER
- ACTIVITIES
- SCIENCE
  - ASTRONOMY
  - ASTROBIOLOGY
- ECONOMIC
  - MAKING STUFF
  - FLYING STUFF
  - OUT + BACK
- TRANSPORT
  - EXPLORING THE MOON... CAVES
  - CRATERS
  - PLANES





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# Individual Perspectives

4

Full Name Stuart McAndrew

Problem: Develop applications for space-borne sensor networks/nodes.

Resources: - 1 or more Picosatellites to be launched into LEO with relatively short lifespan  
- Flatcat Development platform

Outcomes (of hackathon) - Mission Concepts  
- Prototype Payloads  
- Apps?

5

Full Name ELIAS ABOUTANIOS

Ideas for a "Space-a-thon"

- 1- Problems for space or using space?
- 2- For space:
  - de-orbiting payloads
  - Space-traffic management

(Suppose we are in a future time when a great many spacecraft are flying in Low Earth Orbit → how do you deorbit spacecraft while avoiding collisions?)

- 3- Spacecraft that sense their environment  
Predicting collisions → Machine learning?
- 4- Inter-satellite communications links for collision avoidance?

6

Full Name \_\_\_\_\_

Paul Alino.

Network of Ground Stations

Problem: How can we centralise a set of pre-existing ground stations in a cost efficient and reliable way?

- Issues:
- Hardware differences;
  - Comms differences, UHF, optical,
  - Software, both ground & on-orbit.
  - Satellite coverage.

Potential Solutions

- Japan/ESA's OGS network attempts to achieve several OGS connected by fibre.
  - Could we do something similar for UHF?
  - Could this be made portable?



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# Individual Perspectives



7

8

9

Full NAME \_\_\_\_\_

Andrew  
Dennis

Not one of your problems:

- How do we articulate the 'BIG PICTURE' SPACE PROJECT THAT IS A COMMON CAUSE TO INSPIRE PEOPLE IN SPACE?

(focus  
CSO 20  
workshop  
outcomes)

- PARTICIPANTS - THE WHOLE SECTOR
- ~~OUTCOME~~ (PRO)DUG: A PLAN SUPPORTED BY THE SPACE AGENCY
- RESOURCES: JUST PEOPLE? BUT PEOPLE WITH INFLUENCE

GROUND SEGMENT UNIFICATION

→ POLICY SUPPORT?

- STANDARDS - OUTCOME
- OPTIMISATION ALGORITHM FOR CURRENT/FUTURE MISSIONS + STATIONS.

Full NAME Ediz Cetin

- Through TechConnect & workshops connect with SMEs & Academic/Research working in the space domain. Better understand challenges faced by SMEs & how academic help solve them.
- Complete CubeSat built based on Australian capabilities/platforms/systems (commercial) Ground Station.
- Incorporate space related retail & development activity into UG/PG programs.
- Australian Made

Full NAME GAVIN CONIBER

CubeSat  
1 user, 2 antennas  
Multi-stage  
EU 2 EU 4000 EU  
Station keeping?

Deployable antennae

Skin rocket

- deploy HA balloon
- deploy linear accelerator how will it stay there?

Mars

- Solar power tower electric Martian conditions
- use ragdoll to fabricate mirrors STELLAR
- Solar thermal heating

Ground control

Triangulation from several ground stations





## 10

Full NAME EAMONN GLENNON

### GROUND STATION (GS)

PROBLEM → GSs are big, difficult to move, not portable, antenna's are the problem

IDEA: → Instead of 1 big antenna, have 10 or 16 (!) smaller ones in an array  
→ a bit like the CSIRO Square kilometer array, but very very lite  
→ difficult to do in a short period of time.

### Rocket Launch:

~~payload~~

Problem: Payload goes up quickly, comes down quickly & with no control, can't do much in the time available

Idea: Paraglider controlled descent.  
→ large enough to stay up longer  
→ enough control to land in a convenient location

question: can these work @ very high altitude (~10km)  
→ difficult to do in a few days

## 11

Full NAME \_\_\_\_\_ Monique Hollick

### PROBLEM STATEMENT:

HOW SHOULD DEFENCE, INDUSTRY, ACADEMIA AND THE NEW NATIONAL SPACE AGENCY COLLABORATE AND INTERACT TO MAXIMISE THE DEVELOPMENT OF AUSTRALIA'S SPACE CAPABILITIES?

### WORKSHOP:

- AUS INDUSTRY, ACADEMIA, GOVT (DEFENCE + SPACE AGENCY CSIRO...)
- "MENTORS"/GUESTS FROM OTHER NATIONS CONSIDERED TO HAVE SUCCESSFUL, INTEGRATED SPACE INDUSTRIES
- EXCHANGE OF EXPERTISE, CURRENT PROJECTS/INTERESTS, FUTURE ASPIRATIONS, KEY CHALLENGES

## 12

Full NAME \_\_\_\_\_ Kirby Ikin

- As human settlement of space begins people from all quarters of life and disciplines can participate.
- No one owns the high ground.
- We should unleash commercial structures used in non-space domains.
- Space applications impact all sectors of the community so they need to be better informed of what is possible.
- Space 2.0 allows for innovation, but we need to blend that with the lessons from those with decades of experience.



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# Individual Perspectives

13

Full NAME HIRANYA JAYAKODY

1. Fastest ever cubesat assembly/build. in the world?
2. Launch high altitude balloon (30km+ altitude) with,
  - live streaming / telemetry
  - attitude determination & control
  - ~~flight~~ flight control of the payload after detaching from balloon.   
 ← use ADCS developed by Mark from Blazak
3. 5km - rocket launch - live stream similar to SpaceX
4. Build the most compact telescope with highest zoom & quality.
5. Inter-cubesat communication  
or  
Inter - high altitude balloon communication
6. Use machine learning to identify space debris in images captured from ground telescopes.

14

FULL NAME Jannone Kyytönen

Mars project.  
Habitat visit for design & engineering advice  
Dialogue with Indigenous Owners  
Dialogue with education & tourism sector for their needs from site

15

Full NAME DAVID LINGARD (DST Group)

SUCCESS - novel small satellite payload that could be developed by Australian industry & transitioned to ADF or National Security - <sup>possibly launched through Australian industry</sup>

- input from operational community
- DST could help facilitate
- general areas:
  - communications
  - intelligence
  - surveillance
  - reconnaissance
  - precision, navigation & timing
  - others?

Barrier - security classification





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# Individual Perspectives

16

Full NAME Trent McDougall

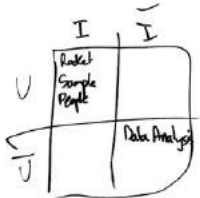
~~Scitech~~

Problem: atmospheric core sampling, what is the human impact/  
foot print as a vertical column. Key locations:

Skills: Electron Microscope.  
Dr Steve Hobbs.

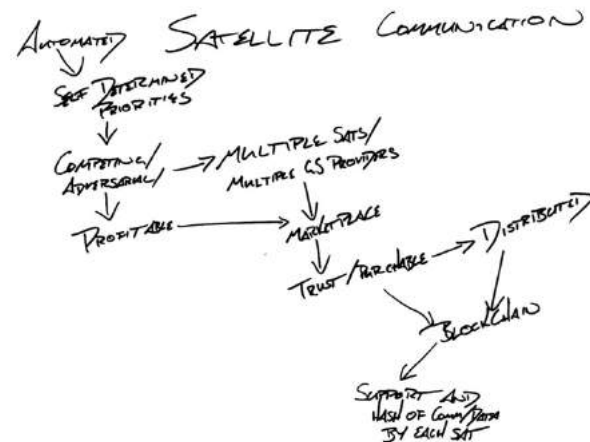
Rapid Development  
re-purpose astronomy equip.

5km Rocket



17

Full NAME Aidan O'Brien



PROBLEM STATEMENT: How to AUTOMATE GROUND SEGMENT TRULY  
AND FASTER THAN MANUAL CONTRACTS?

18

Full NAME MORGAN RENNIE

## SUCCESS

- Leveraging space connect to build STEM interest in next gen workforce (particularly girls)
- Opportunities for companies (new & existing) and industries to transition into space
- Opportunities for regional communities to be "space hotspots"
- Australia [NSW] recognised as a <sup>major</sup> player in the international space community



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# Individual Perspectives



TechConnect

19

Full NAME KEITH ROSARIO

Confession: Non-commercial! STEM!

BIM: Develop something that can be used by kids 4r 6-12 to stimulate STEM interest on a national level - interest in space.

Idea: Use a "space" asset to involve kids over a defined period eg ISS, cubersat, high-altitude balloons.

Because: Space Agency has been announced, and we need more kids to take up STEM career.

For example: every school builds/gets a radio TX that they can use on multiple "space asset" passes to get a "density" image - one-time or progressive.

Output: A terrific picture of every school across Australia that participated. A sense of national participation. A new use space. A news coverage event. Think NASA sponsored eclipse tracking across USA.

Final build: The "kit" every school will need. The "system" that every kit will work with.

20

Full NAME BEN SOUTHWELL

— Blockchain (NOT COIN MINING) to achieve consensus in downlinked data (distributed GS). EG. QBSØ beacons

— Free as in freedom GS HW + SW

— If you want cryptocurrency use PoS not PoW

— Machine learning: identify all variables to log/train

21

Full NAME Matt Tetlow

Remote sensing application  
↳ indices of interest → what problems do users have  
↳ what is the problem space  
↳ engage users/readers

Ground segment/comm

↳ spectrum use/sharing

↳ better than what's done now

↳ large constellations need better use of spectrum





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## Individual Perspectives

# 22

FULL NAME CONNIE YE

### SUCCESS

- FULL REGULATORY + LEGAL COMPLIANCE
- LIFECYCLE OF A LAUNCH
  - ↳ MAPPING ALL LICENCES / CERTIFICATES REQUIRED PRE-LAUNCH
  - ↳ INSURANCE + LIABILITY REGIME
  - ↳ SPECTRUM LICENSING
- ASCERTAINING REG. CERTAINTY
- IDENTIFYING RELEVANT AREAS REQUIRING LEGAL APPLICATION
- SOPHISTICATED CONTRACTS

# 23

FULL NAME Jennifer Zhu

- \* A coordinated Australian community clearly articulating their priorities for developments in space
- \* Building on and creating new international partnerships and collaborations for transferrable applications
- \* Robust conversations from all angles and perspectives on where we are going with:
  - astronomy and astrophysics
  - exploitation of space resources
  - observing and measuring Earth



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## Idea Generation







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## Idea Generation





Participants were asked to group and share their insights to collaborate and amalgamate their perspectives in a set of their 'moonshot' type of ideas.

[illegible][illegible]

The diagram illustrates the relationship between an 'Idea canvas' and a 'Business Model Canvas'. On the left, the 'Idea canvas' is divided into two main sections: 'Value proposition' and 'Channels'. Below these, there is a 'List of business model options' which includes a table with checkboxes for various options like 'New product', 'New service', 'New channel', etc. An arrow points from the 'Idea canvas' to the 'Business Model Canvas' on the right. The 'Business Model Canvas' is divided into four main sections: 'Standard / Wide category', 'Acma', 'Optimisation of processes', and 'Optimisation of costs'. To the right of these sections, there are 'Test options' and 'Acma'.

**Idea canvas**

Value proposition  
Channels

List of business model options

☒ New product  
☒ New service  
☒ New channel  
☒ New business model  
☒ New market  
☒ New technology  
☒ New business model  
☒ New market  
☒ New technology

**Business Model Canvas**

Standard / Wide category  
Acma  
Optimisation of processes  
Optimisation of costs

Test options  
Acma

The screenshot shows a digital canvas titled "Idea canvas" with a grid layout. The grid contains various notes and lists related to business strategy and innovation.

**Top Left:** "Idea canvas" title.

**Top Right:** "Strategic canvas" notes: "design and commercial value of customer", "new functionality", "new business", "new technology", "new business model", "new business structure".

**Bottom Left:** "Business model" notes: "new business model", "new business structure", "new business model", "new business structure".

**Bottom Right:** "Business model" notes: "new business model", "new business structure", "new business model", "new business structure".

**Center:** "Cloud-based infrastructure" notes: "not for the record", "ground between record and virtual", "virtual reality simulation", "new: external connections".

[illegible][illegible][illegible]

The mind map is titled "Idea canvas" and is organized into three main columns. The left column lists various project types: "Policy project", "Education project", "Healthcare project", "Business project", "Non-profit project", "Government project", "Academic project", "Research project", "Social project", "Environmental project", "Cultural project", "Arts project", "Sports project", "Technology project", "Innovation project", "Entrepreneurship project", "Social entrepreneurship project", "Venture capital project", "Private equity project", "Public equity project", "Real estate project", "Infrastructure project", "Energy project", "Transportation project", "Agriculture project", "Manufacturing project", "Retail project", "Hospitality project", "Media project", "Entertainment project", "Education project", "Healthcare project", "Business project", "Non-profit project", "Government project", "Academic project", "Research project", "Social project", "Environmental project", "Cultural project", "Arts project", "Sports project", "Technology project", "Innovation project", "Entrepreneurship project", "Social entrepreneurship project", "Venture capital project", "Private equity project", "Public equity project", "Real estate project", "Infrastructure project", "Energy project", "Transportation project", "Agriculture project", "Manufacturing project", "Retail project", "Hospitality project", "Media project", "Entertainment project". The middle column contains handwritten notes: "policy project: -> Connect with top-levels in hospital", "education project: -> Connect with top-levels in university", "healthcare project: -> Connect with top-levels in hospital", "business project: -> Connect with top-levels in business", "non-profit project: -> Connect with top-levels in non-profit", "government project: -> Connect with top-levels in government", "academic project: -> Connect with top-levels in academia", "research project: -> Connect with top-levels in research", "social project: -> Connect with top-levels in social", "environmental project: -> Connect with top-levels in environmental", "cultural project: -> Connect with top-levels in cultural", "arts project: -> Connect with top-levels in arts", "sports project: -> Connect with top-levels in sports", "technology project: -> Connect with top-levels in technology", "innovation project: -> Connect with top-levels in innovation", "entrepreneurship project: -> Connect with top-levels in entrepreneurship", "social entrepreneurship project: -> Connect with top-levels in social entrepreneurship", "venture capital project: -> Connect with top-levels in venture capital", "private equity project: -> Connect with top-levels in private equity", "public equity project: -> Connect with top-levels in public equity", "real estate project: -> Connect with top-levels in real estate", "infrastructure project: -> Connect with top-levels in infrastructure", "energy project: -> Connect with top-levels in energy", "transportation project: -> Connect with top-levels in transportation", "agriculture project: -> Connect with top-levels in agriculture", "manufacturing project: -> Connect with top-levels in manufacturing", "retail project: -> Connect with top-levels in retail", "hospitality project: -> Connect with top-levels in hospitality", "media project: -> Connect with top-levels in media", "entertainment project: -> Connect with top-levels in entertainment". The right column contains handwritten notes: "policy project: -> Connect with top-levels in hospital", "education project: -> Connect with top-levels in university", "healthcare project: -> Connect with top-levels in hospital", "business project: -> Connect with top-levels in business", "non-profit project: -> Connect with top-levels in non-profit", "government project: -> Connect with top-levels in government", "academic project: -> Connect with top-levels in academia", "research project: -> Connect with top-levels in research", "social project: -> Connect with top-levels in social", "environmental project: -> Connect with top-levels in environmental", "cultural project: -> Connect with top-levels in cultural", "arts project: -> Connect with top-levels in arts", "sports project: -> Connect with top-levels in sports", "technology project: -> Connect with top-levels in technology", "innovation project: -> Connect with top-levels in innovation", "entrepreneurship project: -> Connect with top-levels in entrepreneurship", "social entrepreneurship project: -> Connect with top-levels in social entrepreneurship", "venture capital project: -> Connect with top-levels in venture capital", "private equity project: -> Connect with top-levels in private equity", "public equity project: -> Connect with top-levels in public equity", "real estate project: -> Connect with top-levels in real estate", "infrastructure project: -> Connect with top-levels in infrastructure", "energy project: -> Connect with top-levels in energy", "transportation project: -> Connect with top-levels in transportation", "agriculture project: -> Connect with top-levels in agriculture", "manufacturing project: -> Connect with top-levels in manufacturing", "retail project: -> Connect with top-levels in retail", "hospitality project: -> Connect with top-levels in hospitality", "media project: -> Connect with top-levels in media", "entertainment project: -> Connect with top-levels in entertainment".

[illegible]

**Idea canvas**

**Business Goals**

- 1. Increase sales
- 2. Expand market
- 3. Improve customer service
- 4. Increase brand awareness
- 5. Reduce costs
- 6. Increase employee satisfaction
- 7. Increase innovation
- 8. Increase sustainability
- 9. Increase social responsibility
- 10. Increase transparency

**Business Model**

- 1. Subscription
- 2. Freemium
- 3. Pay-per-use
- 4. Ad-supported
- 5. Direct sales
- 6. Indirect sales
- 7. Partnership
- 8. Joint venture
- 9. Franchise
- 10. Licensing

**Business Plan**

- 1. Executive summary
- 2. Company description
- 3. Market analysis
- 4. Organization and management
- 5. Products and services
- 6. Marketing and sales
- 7. Financial projections
- 8. Risk analysis
- 9. Appendix
- 10. Conclusion

**Business Description**

INTRODUCTION OF IDEA  
 LAYERS FOR FOUNDATION OF PROJECT  
 LAYERS STRUCTURE

WORKING MODEL STRUCTURE TRANSFORMATION  
 CONCEPTS

ADDITIONAL TIME/STRUCTURE FOR OTHER  
 CONCEPTS

**Business Description**

LEAD CUSTOMER THROUGH  
 THE BUSINESS JOURNEY

**Business Description**

Business description is a key element of a business plan. It provides a detailed overview of the business, its products and services, its market, and its competitive advantage. The business description should be clear, concise, and compelling, and it should be tailored to the specific needs of the business and its target audience.

**Business Description**

Business description is a key element of a business plan. It provides a detailed overview of the business, its products and services, its market, and its competitive advantage. The business description should be clear, concise, and compelling, and it should be tailored to the specific needs of the business and its target audience.


The screenshot shows a Google Docs document titled "Idea canvas" with a handwritten business model canvas for a company named "DEBENCE".

- Company Name:** DEBENCE
- Customer Segments:** DAVID L.
- Value Proposition:** PROVIDE A TOOL TO...  
DEBENCE  
GET THEIR OPERATIONAL COMMUNITY TOGETHER
- Channels:** (Listed but empty)
- Relationships:** (Listed but empty)
- Revenue Streams:** (Listed but empty)
- Cost Structure:** (Listed but empty)
- Key Resources:** (Listed but empty)
- Key Activities:** (Listed but empty)
- Key Partners:** (Listed but empty)
- Unarticulated Needs:** (Listed but empty)
- Unarticulated Problems:** (Listed but empty)
- Unarticulated Solutions:** (Listed but empty)

Handwritten notes on the canvas include:

- An arrow pointing from "OPERATIONAL COMMUNITY TOGETHER" to "UNARTICULATED PROBLEMS" with the text "(UNSATISFACTION ISSUES)".
- Below "UNARTICULATED PROBLEMS", it says "they can bring problems to work".

The image shows a digital idea canvas with four panels. The top-left panel contains the text "SILKE BUCHHEIT" and "PÄRTEL". The top-right panel contains "2 COMPLETES, NACHSTREICHUNG?" and "PÄRTEL". The bottom-left panel contains "BLAUWATIN - PROTEST IN SILKE E.G. WÄRD (ULA) GELBEIT: BYRON SEURE TRANSACTIONS". The bottom-right panel contains "WÄRD".

 Idea canvas		
Spine builds motivation.		
Spine fits force (SFIIF)	How can we determine the number of activities around an experience? → Study spreadsheet around → Get coverage with topic force with point data → Measure timing to add more elements	Effects regularly and how much content → Define metric framework during initial research → Set targets for content goals → Create strategy to add content → Review progress and metrics
How can we describe a spreadsheet?	Is it a useful measure? → On desktop systems → Mobile (looking for critical measures) Legal considerations, privacy	→ The information needed for creating
Responses of spreadsheet	→ Get visualization on worldwide activities	Resources & links → The 2014 New Zealand marketing book → Spine book & policy







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## Next Steps

