IOT Ch-9
BUSINESS MODELS

- **Introduction:**
- Definition: It is "hypothesis about what customers want, how they want it, and how an enterprise can organize to best meet those needs, get paid for doing so, and make a profit".
- This definition brings together a number of factors:
- ▪ A group of people (customers)
- ▪ The needs of those customers
- ▪ A thing that your business can do to meet those needs
- ▪ Organisational practices that help to achieve this goal—and to be able to carry on doing so, sustainably
- ▪ A success criterion, such as making a profit

Q1) Explain the HISTORY OF BUSINESS MODELS.
- Gift economies develop where those with the appropriate skills can provide their products or services and expect repayment of this obligation not immediately but with a gift of comparable worth later.
- Modern business models are resulted from the technology required to move products and obligations through space and time.

- **SPACE AND TIME**
- While neighbouring tribes might have discovered variants in the local area's resources it is when trade develops with others from far-off lands that it becomes really interesting.
- A merchant might sell silks made in his village to a region where these cloths are rare and in demand in exchange for aromatic spices which will be highly prized back home.
- But long-distance trade brings with it a whole set of problems:
- merchants have to carry larger quantities of goods for sale
- Their goods and food carried will have to last far longer, so they will need to be protected and preserved.
- they need to have a reliable means of transport for themselves and their merchandise
- Preservation is also a way of transporting goods through *time*.
- A farmer or trader who can afford to not sell all his produce during the harvest can fetch a better price months later at a higher price.
- Money, then, abstracted trade further, setting an easy-to-calculate exchange rate between a fixed currency (a certain size disc of gold or weight of grain).
- Ease of calculation which this development brought with it made it easier to develop new business models, such as the development of interest on loans.

- **FROM CRAFT TO MASS PRODUCTION**
- When Gutenberg demonstrated his printing press circa 1450, books changed from being priceless treasures, hand-crafted by monks and artisans, to a commodity that could be produced.
- The invention laid the foundations for an information culture.
- Information is no longer so rare and valuable that it must be preserved by gatekeepers but can be so widely spread that everyone can have access to it.
- As the printing press spread to the New World and India via the sea routes that would be discovered by the end of the century.
- The cost of printing would become ever smaller as the technology spread, leading to new business models with the rise of newspapers and pamphlets.
- In other areas, the ethic of mass production resulted in new business models such as supermarkets, which pioneered both "self-service shopping" and the sale of a whole range of products under one roof.

- Fast-food franchising began in the 1930s and exploded with McDonald's and Burger King in the 1950s. Standardized menus, pre-prepared ingredients, and standard practices for each franchisee to follow meant that you could now eat
- Exactly the same meal in any of a chain restaurant's stores in your country.

- **THE LONG TAIL OF THE INTERNET**
- From Tim Berners-Lee's first demonstration of the World Wide Web in 1990, it took only five years for eBay and Amazon to open up shop and emerge another five years later as not only survivors but victors of the dot-com bubble. Both companies changed the way we buy and sell things.
- A physical bricks shop has to pay rent and maintain inventory, all of which takes valuable space in the shop; therefore, it concentrates on providing what will sell to the customers who frequent it: the most popular goods.
- In comparison, an Internet storefront exposes only bits, which are effectively free. Of course, Amazon has to
- Maintain warehouses and stock, but these can be much more efficiently managed than a public-facing shop.
- Long tail Internet giants help this process by *aggregating* products from smaller providers, as with Amazon Marketplace or eBay's sellers.
- This helps thousands of small third-party traders exist, but also makes money for the aggregator, who don't have to handle the inventory or delivery at all, having outsourced it to the long tail.
- Yet although Google's stated goal is "to organize the world's information and make it universally accessible and useful", it makes money primarily through exploiting the long tail of advertising, making it easy for small producers to advertise effectively alongside giant corporations.

- **LEARNING FROM HISTORY**
- What have we learnt that we could apply to an Internet of Things project that we want to turn into a viable and profitable business?
- First, we've seen that some models are ancient, such as Make Thing Then Sell It.
- The way you make it or the way you sell it may change, but the basic principle has held for millennia
- Second, we've seen how new technologies have inspired new business models.
- Third, although there are recurring patterns and common models, there are countless variations. Subtle changes to a single factor, such as the manufacturing process or the way you pay for a product or resource, can have a knock-on effect on your whole business.
- Finally, new business models have the power to change the world like mass production changed the notion of work itself.

Q2) What is the use of THE BUSINESS MODEL CANVAS? Explain each template box.
- One of the most popular templates for working on a business model is the Business Model Canvas by Alexander Osterwalder and his startup, the Business Model Foundry.
- The canvas is a Creative Commons–licensed single-page planner.
- The boxes are designed to be a good size for sticky notes, emphasizing that you can play with the ideas you have and move them around.
- Also the layout gives a meaning and context to each item.
- Let's look at the model, starting with the most obvious elements and then drilling down into the grittier details that we might neglect without this kind of template.
- At the bottom right, we have *Revenue Streams*, which is more or less the question of "how are you going to make money?"
- Although its position suggests that it is indeed one of the important desired *outputs* of the business.

- The central box, *Value Propositions,* is, in plainer terms, what you will be producing—that is, your Internet of Things product, service, or platform
- The *Customer Segments* are the people you plan to deliver the product to.
- The *Customer Relationships* might involve a lasting communication between the company and its most passionate customers via social media.
- Maintaining a "community" of your customers may be beneficial, but which relationships will you prioritise to keep communicating with your most valuable customer segments?
- *Channels* are ways of reaching the customer segments.
- From advertising and distributing your product, to delivery and after-sales, the channels you choose have to be relevant to your customers.
- On the left side, we have the things without which we have no product to sell.
- The *Key Activities* are the things that need to be done.
- The Thing needs to be manufactured; the code needs to be written.
- *Key Resources* include the raw materials that you need to create the product but also the people who will help build it.
- Few companies can afford the investment in time and money to do all the Key Activities themselves or even marshal all the Key Resources.
- You will need *Key Partners*, businesses that are better placed to supply specific skills or resources, because that is their business model, and they are geared up to do it more cheaply or better than you could do yourself.
- Perhaps you will get an agency to do your web design and use a global logistics firm to do your deliveries.
- The *Cost Structure* requires you to put a price on the resources and activities you just defined.
- Helps you determine whether you will be more cost driven (sell cheaply, and in great volume via automation and efficiency) or more value driven (sell a premium product at higher margins, but in smaller quantities).

The Business Model Canvas

Q3) WHO IS THE BUSINESS MODEL FOR?
- Primarily, the reason to model your business is to have some kind of educated hypothesis about whether it might deliver what you want from it.
- the canvas help you think about the business and give you ways to brainstorm different ideas:
- ▪ What if we target the product at students instead of businesses?
- ▪ What if we outsource our design to an agency?

- ▪ What if we sell at low volume/high value instead?
- The model is also useful if you want to get other people involved.
- This could be an employee or a business partner…or an investor.
- In each of these cases, the other parties will want to know that the business has potential, has been thought out, and is likely to survive and perhaps even go places.
- Your *customers* will also be considering whether to invest their time and money in your product.
- They will ask themselves certain questions about it.
- some of these likely questions are:
- ▪ **Why should I waste time trying out Yet Another Social Network? I think I'll wait and see whether all my friends join it first.**
- This first question is about your "Value Proposition" (that is, the product) and a reasonable concern if you are trying to get into a market that already has good or popular solutions.
- ▪ **Your online document collaboration looks great, but is it worth my moving my whole business to it? If you stop trading or change the platform, we may have to redo all the work again.**
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- Such customers may well be interested in the details of your business model to calculate whether the risk they've identified is worth their commitment.
- ▪ **This free service is fantastic, but why don't you let me pay for it, so I can get consistency, receive support, and avoid adverts?**
- Lastly, many customers are aware of alternative charging models that they would prefer and might prefer a different one.
- Not all customers vote for the free option.
- It has been stated about "free" products: "If you're not paying for something, you're not the customer; you're the product being sold".
- several assumptions often made are:
- ▪ Not paying means not complaining.
- ▪ You're either the product or the customer.
- ▪ Companies you pay treat you better.
- ▪ So startups should all charge their users.
- Powazek suggests that the actual lesson to be learned is that:
- *Your business plan cannot be secret anymore. People are too smart for that, too tired of getting burned, too wary of losing their contributions when a startup dies, and too annoyed by sudden changes to the terms. Communicate your business plan from the start and you'll avoid a thousand problems down the road.*

Q4) Explain some of the models that Internet of Things companies have used or might use. MAKE THING, SELL THING
- Adrian sells custom-built Bubblini, and the startup Good Night Lamp is preparing to ramp up production of its eponymous lamps as an off-the-shelf product.
- Many small-scale projects take the option of selling the product in "kit" form, with some assembly required.
- Because kits are assumed to be for specialists and hobbyists rather than the general public, the administrative burden may be lower.
- However, making a decision to limit your target market may well limit the potential revenue also.

SUBSCRIPTIONS
- An ongoing service implies costs to the provider—development, maintenance of servers, hosting costs, and in some cases even connection costs.

- A subscription model might be appropriate, allowing you to recoup these costs and possibly make ongoing profit by charging fees for your service.
- In the future, content publishers may pay for certain premium services.
- People happily pay subscriptions to music services, corporate groupware, and of course, mobile phones so perhaps Internet of Things products in these spaces will find subscription more appealing to their consumers.
- In so-called freemium model ("free" and "premium") a smaller or larger part of your product is free, while the users are also encouraged to pay a premium to get additional features or remove limits.
- This model could be combined with our first two models:
- Buying the physical device gives free lifetime access to the associated Internet service, but additional paid services are also available.

CUSTOMISATION
- For a mass-produced item, any customisation must be strictly bounded to a defined menu: a selection of different colours for the paintwork.
- The websites Facebook, Twitter etc offer small degrees of customisation within strictly defined boundaries: a selection of (tasteful) colour schemes and background of your choice.
- Many Internet of Things products have some possibility of customisation:
- Every Bubblino has a name (given to it by Adrian), but the user can also change which phrases he listens to on Twitter.
- The new manufacturing techniques, such as laser cutting and 3D printing, should allow great possibilities for customising even the physical devices.
- MakieLab (http://makie.me) make dolls that can be designed online.

BE A KEY RESOURCE
- Not every Internet of Things business will be selling a product to the mass market.
- Some will sell components or expertise to other companies—that is, component manufacturing or consultancy services.
- Effectively, in this kind of business, you are positioning yourself as a "key resource" or a "partner" in somebody else's business model.
- Small companies such as Adafruit sell electronic components to hobbyist makers.
- On the consultancy side, work will be available either simply providing your skills for hire or indeed in providing vision and expertise for strategic planning to a company that wants to engage with the Internet of Things.
- Environmental data consultancy amee (www.amee.com) provides means for not only consumers but also businesses and government bodies to improve their environmental impact by getting hard data about their carbon footprint—not just their direct energy usage but also the energy used to dispose of their waste.

PROVIDE INFRASTRUCTURE: SENSOR NETWORKS
- Sensor data is a fascinating topic in the Internet of Things: There are official data sources which are expensive to create and hard to access and they can exist only where a government body or company has chosen to apply its large but finite resources.
- The long tail of third-party data sensor enthusiasts can supplement or sometimes outclass the official streams of information.
- What is needed is a platform to aggregate that data, and one of the companies competing to fulfil that role is Xively.
- They allow any consumer to upload a real-time feed of sensor data.
- Xively was intended to provide a free, public infrastructure for open source data while also providing enhanced commercial offerings with enhanced capacity and privacy options and formal service level agreements (SLAs).

- Sensor data is information, which can be shared freely or might simply be sold. Many energy suppliers are rolling out "smart meters", which promise greater efficiency and therefore cheaper bills but also aggregate huge quantities of information.
- As regards the business model, you need to consider the legality of such collection and whether it fits with your company values.

TAKE A PERCENTAGE
- In the example of sensor networks, if the value of the data gathered exceeds the cost of the physical sensor device, you might be able to provide that physical product for free.
- You could also link devices to advertising to reduce the price.
- Even without charging the *end user* of your Internet of Things device, there will be many options to make a profit from somewhere
- (ad revenues, payment for data services from companies or state organisations, commission for data bandwidth incurred, etc.)
- Perhaps future versions of Bubblino could also be triggered for occasional promoted tweets.
- Perhaps your Internet-enabled fridge will make tutting noises when you fill it and suggest other (promoted) options for your next shop.

Q5) List and explain the possible ways to get funds for AN INTERNET OF THINGS STARTUP?
- There will most likely be a period when you have only costs and no income.
- The problem of how to get initial funding is a critical one.
- If you have enough personal money to concentrate on your new Internet of Things startup full time, you can fund your business yourself.
- For others there are still ways to kick off a project.
- If the initial stages don't require a huge investment of money, your time will be the main limiting factor.
- If you can't afford to work full time on your new project, perhaps you can spare a day in the weekend or several evenings after work.
- Many people try to combine a startup with a consultancy business, planning to take short contracts which support the following period of frantic startup work.
- Making sure that you *don't* need to spend huge amounts on the startup is key.
- You probably don't need an office in the early stages, and perhaps you don't need expensive Aeron chairs.
- You can work from your kitchen table, a café, or out of a co-working space.

HOBBY PROJECTS AND OPEN SOURCE
- If your project is also your hobby, you may have no extra costs than what you would spend anyway on your free-time activity.
- One way to make a project grow faster might be to release all the details as open source and try to foster a community around it.
- This approach can be hard work and can benefit from a natural talent, experience, or luck in attracting and maintaining good collaborators.
- After you have open-sourced a project, you can't close-source it again.
- Yes, you can probably fork the project and continue to work on it in secret, but the existing project may carry on if your collaborators are enthusiastic enough about it.
- Indeed, your idea, code, and schematics could be used by others in their own commercial offering.
- Careful consideration of the license used may be critical here: A more restrictive license such as the GPL requires those who build on your work to share their source code also under the same terms.
- when thinking about open source, remember that as the project initiator and owner, you would be the best placed in forming a company around the project and are more likely to get benefits from the relationship with the community:

- ▪ Many pairs of eyes and hands testing, reporting problems, fixing them, and building new features
- ▪ Many passionate users with real use cases and opinions about the product—better than any focus group
- ▪ The goodwill of that community, with its ready-made network of personal recommendations and social-media marketing

VENTURE CAPITAL
- Getting funding for a project from an external investor presents its own work and risks.
- Startups often concentrate their fundraising activities into *rounds*, periods in which they dedicate much of their effort into raising a target amount of money, often for a defined step in their business plan.
- Before any official funding round comes the informal idea of the *friends, family, and fools* (FFF) round.
- This stage may be the one in which you've contributed your life savings, and persuaded your aunt, your best friend, and a local small business to pitch in the rest, on the basis of your reputation.
- Although it's important to consider the possible impact on your personal relationships, this round of funding may be the most straightforward to get hold of.
- A common next step would be an *angel* round.
- The so-called angels are usually individual investors, often entrepreneurs themselves, who are willing to fund some early-stage startups which a more formal investor.
- Though angels take on a lot of risk in investing so early, before companies have proved themselves, they tend to invest in a number of companies to spread the risk.
- They usually want equity in your company, a percentage of the value of the company, that will pay back their investment if and when you do well.
- Angels typically disburse sums that are significant for early-stage startups—in the region of tens or possibly hundreds of thousands of pounds.
- These angels might also demand a place on your board of directors, to oversee their investment, but also out of interest in helping the company to succeed.
- The *venture capital* (VC) round is similar, but instead of your courting individual investors, the investor is a larger group with significant funds, whose sole purpose is to discover and fund new companies with a view to making significant profit.
- Typically, VC funding will be larger chunks of money, from half a million pounds up.
- In the early stages, would be an *accelerator*, which might be run by a venture capital firm.
- In this case, part or all of the money that could be awarded to your company is paid in kind, in the form of free office space, consultancy, and specific training and mentoring in areas that the investor believes will make you a success.

- You need to be aware that by accepting investment through venture capital, you are committing yourself to an *exit*.
- An exit strategy is a "method by which a venture capitalist or business owner intends to get out of an investment that he or she has made".
- Because your investors will want a return, your long-term goal can't just be to make your company successful but to do it in such a way as to pay back the investment.
- Typically, you have only two exits:
- ▪ **You get bought by a bigger company:** In this case, the buyer buys out the investors; that is, the buyer pays the investors the value of their percentage equity of their perceived valuation of the worth of the company.
- ▪ **You do an IPO (initial public offering)—that is, float on the stock market:** This involves new shares being issued and sold to the stock market.
- Although this option "dilutes" the value of the shares already issued, the existing holders are able to then sell their shares on the market too, to get back their investment, or to retain the shares if they believe that the shares will grow in value.

GOVERNMENT FUNDING

* Governments typically want to promote industry and technological development in their country, and they may provide funds to help achieve particular aims.
* Although governments can and do set up their own venture capital funds or collaborate with existing funds in various ways, they generally manage the majority of their funds differently.
* For one thing, they also want to fund *existing* companies to do new research and innovation.
* The money provided still has "strings attached", but they are likely to be handled differently:
* ▪ **Outputs:** Deliverables are the metrics that an awarding body may use to tell if you are doing the kind of thing that the body wants to fund.
* This metric may simply be a test that you are managing the money well or may be related to the goals that the body itself wishes
* to promote.
* You might be required to write regular reports or pass certain defined milestones on schedule.
* If your funding is given in stages, the later payments may be conditional on successful delivery of previous outputs.
* You may be required to *match funds*; that is, if you were awarded L10,000, you would also have to raise L10,000 yourself
* ▪ **Spending constraints:** Some funding may require you to spend a proportion of the money on, for example, business consultancy or web development, perhaps with the fund facilitator's company or associates.
* Governments will, however, try to split their pot of money to fund the outcomes that they are interested in as policy.
* Quite reasonably, this may tend to favour grants for research over grants to help get to market.
* After all, after the product is proven, the company should be able to afford to fund it by itself or get VC funding.
* It is perfectly normal for companies to work through multiple sources of funding.

CROWDFUNDING

* we can think of crowdfunding as the long tail of funding projects.
* Getting many people to contribute to a project isn't exactly a new phenomenon.
* Over millennia many civic and religious monuments and constructions have been funded at least partly by the public.
* However, such projects have been mostly sponsored and given focus by some influential person or body.
* The main options for crowdfunding are Kickstarter (www.kickstarter.com) and Indiegogo (www.indiegogo.com).
* Historically, Kickstarter was available to use only for funding projects based in the US, whereas Indiegogo set itself up to be "the world's funding platform".
* Appealing text, slick videos, and great design may make the difference between yours and a competing project.
* Because even some successfully funded projects may fail, older and wiser crowdfunders may be more likely to fund projects in which they see some attention to the business model or a track record for successful completion by the project team.
* Our funders are real people and will have all the variety of concerns that any group of real people have.
* This interaction with a large and diverse group is a key part of the interest of this method of funding:
* It is far more than just the money.
* Crowdsourcing allows you to know the customers interest in your product.
* Assuming that the aggregators (Kickstarter, Indiegogo, and the rest) are doing their job well, they will reach a good segment of the potential customers for your Internet of Things product.
* If there is no interest, perhaps the product is not a winner as currently specified and advertised.

- If the project goes viral, as happens occasionally, and gains far more than the targeted amount, you know you have a potential hit on your hands.

Q6) what are LEAN STARTUPS?
- The concept of a "lean startup," pioneered by Silicon Valley entrepreneur Eric Ries, springs from this idea (*The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Crown Business, 2011)
- Many lean proponents suggest setting up a landing page for a project with a simple form to register interest.
- This is quick and simple to do, especially as numerous startups do exactly this.
- These simple pages allow you to propose many projects and focus only on the ones that have most feedback.
- In many ways, this "laziness"—doing the minimum now and putting off the hard work till later—is also the reason that we have split the *prototype* from the final product.
- There is a time to market your project, a time to ensure that the idea works, and a time to build a sellable product.
- If you are thinking "lean", you should be applying this idea at all stages.
- For example, at the first stages of production and marketing, you should be working towards the "Minimum Viable Product".
- This is still a sellable product rather than a prototype, but with all extraneous features removed, it may *feel* like a prototype of your final vision for the product.
- All the initial efforts are towards making this product because it can be sold.
- If you have time and money afterward to add additional enhancements to the product, service, packaging, and so on, this will add more value.
- But adding those enhancements to an incomplete prototype would not result in a working business model.
- The essence, then, of lean is to be able to iterate, performing the tasks that are required to get things moving at this stage, without investing time upfront to make everything perfect.
- You can tweak in response to the feedback you get from iterating your product in the real world.
- Such tweaks are known as *pivots* and usually work by changing one part of your model—think one of the boxes on the Business Model Canvas.
- For instance:
- ▪ **Zoom-in pivot:**
- Focus on what was only a part of the value proposition, and turn that into the whole Minimum Viable Product.
- ▪ **Customer segment pivot:**
- Realise that the people who will actually buy your product aren't the ones you were originally targeting.
- While you can continue to make exactly the same product, you have been marketing it to the wrong people.
- ▪ **Technology pivot:**
- Accomplish the same goals as before, but change the implementation details.
- This pivot would be a business decision, made to improve manufacturing costs, speed, or quality.