Business Models for Academic Prototypes:
A New Approach to Media Innovation

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This article introduces the concept of academic prototypes in media innovation, and shows how such prototypes can lead to innovation in market-based journalism. We propose an innovation method that transforms an idealistic, value-oriented prototype into a market-oriented journalistic service. The principles for product development presented here are based on the lean startup method as well as business model canvassing. A prototype scenario shows how the locative information app PediaCloud could be transformed from a serendipitous search engine into a locative news service for a regional newspaper in Western Norway. Ideally, the academic prototype will be transformed into a novel and engaging way of reading news stories, and a profitable solution for the newspaper. Realistically, the team will have acquired empirical validation of the business model's strong and weak points. In the conclusion, we summarize the utility of the approach for validated learning and make recommendations for further research on innovation with academic prototypes.

INTRODUCTION TO THE MEDIA BUSINESS

While Christensen (1997) presumes mechanical and physical innovation as the basis of business disruptions, McQuivey (2013) presumes the internet and digital infrastructure: "The distance between an idea and the digital realization of that idea is now so short – so cheap and so quick – that a bright twelve-year-old can do it" (p. 5). McQuivey argues that established companies will be undercut by digital competitors who are taking advantage of new platforms, tools, and relationships to consumers, and introduce new ways of doing business.

The media industry is particularly hard hit by digital innovation. Legacy media such as newspapers and broadcast TV face long-lasting and disruptive challenges from websites, social media, and mobile apps. The newspaper market in Norway is struggling, and the traditional practices of news journalism are under duress. National newspapers like *VG*, *Dagbladet*, and *Aftenposten* and regional newspapers such as *Bergens Tidende* and *Stavanger Aftenblad* are experiencing economic decline and little support from their owners.

Legacy media go through an enforced innovation process. As novel publishing outlets on the web and social media are taken up in the population, media habits change. Nationally important media such as *Aftenposten*, *Dagbladet,* and *TV2* see their income streams and public dominance being weakened, and they have to defensively follow up the novelties in other sectors. Legacy media have to reinvent their in-

terfaces, content genres, business models, and user groups. Most significantly in our context, they have to transition their journalistic communication values. The core values of journalism, such as truthfulness, autonomy, critical attitude, and transparency, are under pressure. Legacy media could ideally transition their journalistic methods into the digital infrastructure more resolutely.

For newspapers, one of the greatest challenges today is maintaining financial sustainability (Leurdijk, Slot, & Nieuwenhuis, 2012). Traditionally, advertising has played a key role in balancing out the financial scale for newspapers, but with the transition to digital platforms and the dispersal of advertising revenue to non-editorial and social media giants such as Google and Facebook, advertising revenues have significantly decreased and are unable to make up for the losses in print advertising. As for broadcast TV, there is also an increasing shift and intention from advertisers to redirect budgets from regular TV ads into digital video (Vranica, 2014). With this transition to non-editorial giants such as YouTube, the risk of long-term advertising revenue loss increases. There is a reduction in resources for the journalism sector in a majority of EU Member States, and a general decline in journalistic quality can arise alongside a loss of independence and pluralism, critical for journalism's role as a watchdog of democracy (Economisti Associati, 2011).

There is no economic muscle to invest in risky development projects. Sjøvaag (2014) shows that the corporate media company Schibsted's cost-cutting measures initiated in 2012 include staff reductions, content syndication, and centralization of core services. This trend towards shrinking newsrooms, digital specialization, and centralized layout and editing is recognized internationally, particularly in chain newspapers (Sjøvaag, 2014).

There are strong barriers to innovation in legacy media. These organizations are held in check by a conservative attitude among their employees. Ekdale, Tully, Harmsen, and Singer (2015, p. 383) find that in the news industry, "those who believe their jobs are at risk are unlikely to change their practices and even some who perceive job security are reticent to initiate change." Job insecurity in the news industry limits the degree of creative changes in the journalism practice (ibid.). Westlund and Krumsvik (2014) find the same limiting effects. They argue that editorial staff in the newsroom and sales personnel in the business department are perceived to be significantly less interested in digital innovation work than their colleagues in the IT department. Newspapers and broadcasters often move too slowly for their own good (Ruud, 2014, p. 19), and this opens space for new companies to emerge and disrupt the market in various fields and genres of journalism, for example, breaking news. Companies such as Twitter, Face-book, and Buzzfeed have become providers of a very different form of news from what traditional journalism represents.

For journalism to take up new technological tools, Brock (2013, p. 5) writes the industry requires a combination of *existing organizations that adapt*, and *new entrants that can supply a demand better*. Brock promotes experimentation as a key factor for both legacy media and startups: "Success or failure will be determined by the quantity and quality of experiments to find out what works" (Brock, 2013, p. 5). For example, Maiden, Zachos, Lockerbie, Brock, and Traver (2016) are attempting to transform an existing academic prototype for dementia care into a journalistic service called JUICE. This is a tool for creative support to journalists during the research and writing phase, with a focus on hard news.

Interestingly, the same experiment-driven approach is heavily adopted in the startup world, namely by the widespread adoption of The Lean Startup methodology (Ries, 2011). A startup can be defined as an organization formed to search for a repeatable and scalable business model. A startup does not know in advance what its business model is going to be, and cannot therefore adopt classical "business planning" methodologies that fit mature companies. New media startups such as RAd by M'labs, Hubii, Sixty, and Capsule.FM, to name a few Norwegian ones, must constantly adopt a combination of business-

hypothesis-driven experimentation to acquire what Ries (2011) calls "validated learning." All this must be done within the economic constraints of the startup, in the most efficient way possible. We believe that the same principles of short-term iterations and milestones can be adapted to the situation where an existing academic prototype is brought to market.

In summary, this article presents a methodical way for academic prototypes to contribute to innovation in journalism, in the specific context of Norwegian media innovation in the 2010s. First, the article defines the important concept of "academic prototype" before going into the concrete steps of the innovation method. We propose an innovation method that transforms an academic prototype into a market-oriented journalistic service, based on the lean start-up method as well as business model canvassing. The main body of the article shows how a business model can be progressively developed and validated, leading to a market-oriented service for a media company. The authors describe a prototype scenario where the locative information app, PediaCloud, is transformed into a locative news service for the regional newspaper *Bergens Tidende*. In the conclusion we make recommendations for further research on innovation with academic prototypes.

ACADEMIC PROTOTYPES

Our main hypothesis is that an academic prototype can lead to innovation in journalism because it emerges outside the media business itself. Academic prototypes, in contrast to most development projects in media businesses today, are not immediately bound by economic constraints, and can run over a long period of time with thorough testing from members of the public. Due to its rigorous methods, academia can bring novel communicative qualities to the industry, and perhaps also introduce new media technologies among the citizens.

The original contribution of this article is the business-minded application of academic prototypes, and the validated learning that such prototyping can give. This is lacking in the Nordic and European media innovation literature. Storsul and Krumsvik (2013) introduce innovation theory in the media sector, with a number of empirical contributions relating to the news industry. Morlandstø and Krumsvik (2014) explore innovation (and the lack of it) in local news media in Norway, while Ruud (2014) and Vaagan and Barland (2015) focus on disruption and entrepreneurship in the news industry on a national level. Gynnild (2013) identifies three main pathways for innovation in journalism: the newsroom approach, the academic approach, and the entrepreneurial approach. However, none of them propose a way for

specifically academic prototypes to be an ingredient in innovation.

We must define the concept of "academic prototype." In our approach, invention comes before innovation (Nyre, 2015). There has already been an inventive, design-oriented phase in the academic setting before the innovation process towards the marketplace begins, and we want to propose a sequence of events for this vulnerable transformation process. The strategy we adopt can be called "first invention, then innovation," and it finds support in, among others, Winston (1998), who distinguishes between function-oriented invention and market-oriented innovation. Kotsemir, Abronskin, and Meissner (2013) present the invention/innovation sequence as one among several strategies to choose from.

An invention is a new technological solution to a predictable or previously unknown need. It can be a tool, machine, interface, system, or other technology that takes the form of a prototype at a certain level of readiness, and with room for further development. Academic environments can be good incubators for inventions, since these are not usually constrained by short-term economic and technologic restrictions, as often happens within the industry (Nyre, 2010). Innovation must consequently be seen as a way of giving direction to invention. Innovation is defined as "the implementation of goods (products) that are

new to consumers, or higher quality than their previous counterparts" (Kotsemir et al., 2013, p. 4).

Academic prototypes are typically created according to the principles of design science (Hevner & Chatterjee, 2010). A prototype doesn't become academic merely by having been built by people who work in academia. This would not give it any special value. It has to be created with an explorative mind frame and through rigorous methods (Nyre 2009, 2014). The main objective is knowledge expansion, not financial profit. Academic prototypes often contain an implicit value ultimatum – that the purpose is to do good. And the good of academic prototypes resembles the good of journalism in being focused on truthfulness and autonomy. However, the academic research is successful if there are publications about the prototype, and academics may not strive for further popularization or innovation attempts. When prototypes come out of such a process, however, they could have brought something really novel to the industry. It seems that academic prototypes are more likely to be picked up and tested commercially in *clusters* than in bilateral collaborations. The scenario presented below presumes collaborative structures between academia, legacy media and regional start-ups. These can be called *incubators*, *ecosystems*, or *business clusters*. Presumably the proximity of media companies to each other will generate productive competition and exciting new products. This involves a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Media City UK in Manchester is an example, and Media City Bergen in Norway is another one.

It seems to be verified that industry clusters on average encourage innovation, but the quality of the results vary considerably (Fang, 2015). Important factors that influence the outcome are industry type and geographical region, but also internal factors such as concentration in the cluster (a few economically large companies in a cluster have less positive effect than many smaller companies), and specialization (more specialized clusters have better results). In a study of a New Media Cluster in Vienna it is shown that one of the main barriers for innovation and growth is weak technological knowledge with limited ability to adapt to new technologies (Sinozic & Tödtling, 2015).

Media clusters can include all kinds of media businesses, from legacy media to small and large startup companies, design bureaus, etc. There are professionals in many fields, student interns, academics, and other contributors. By being located in a cluster these creative actors will presumably align their interests and collaborate technologically in various ways. The cluster model ensures the essential geographical and organizational proximity of successful industry/university collaborators (D'Este, Guy, & Iammarino, 2013). This article is particularly concerned with the role of academic research for innovation in a cluster such as Media City Bergen.

THE PROPOSED METHODOLOGY

Our approach is not about product innovation, but method innovation. We explore the case with the proposed method, evaluate it, and establish validated knowledge about its merits. As such it fits within a design science concept as it is used, for instance, in information systems research (Hevner & Chatterjee, 2010). Essential in such research is the artifact that is constructed and evaluated to assess its potential value. In our case the artifact is a method for collaboration in innovation, and the least strict form of evaluation is applied, namely a "proof of concept" evaluation, where the concept is our proposed method and the proof is a case described in detail below. What is designed is *a boundary-crossing method*, in that it stipulates a way for academics and journalists/media producers to collaborate. This is process-understanding, or an exercise in "validated learning" for those attempting it.

To discover a business model suitable for academic prototypes in media clusters, we expand on the method called "the lean startup." A startup can be defined as an organization formed to search for a repeatable and scalable business model. A business model describes how a company creates, delivers, and captures value. In other words, a business model

describes how a company makes money, or, depending on its key metrics, gets users, grows traffic, etc. (Blank, 2010). According to Ries (2011, p. 3) "Startup success can be engineered by following the right process, which means it can be learned, which means it can be taught." We presume that this is actually the case, which means that success for an academic prototype is fundamentally a matter of engineering the best possible process – or method.

A startup is searching for a repeatable and scalable business model. The key word here is "search," which implies that a startup does not know what its business model is and cannot therefore adopt classical "business planning" methodologies that fit mature companies. In other words, a startup is not a smaller version of an established company, and therefore requires different management principles and methodologies. The lean startup adopts a combination of business-hypothesis-driven experimentation and iterative product/service releases, to constantly acquire with the lowest time interval possible what Eric Ries calls "validated learning" (Ries, 2011, p. 37). Through these learning intervals the startup progressively looks to discover its business model until it eventually reaches a valid model or runs out of resources in its pursuit (e.g. runs out of time/funds). This way of thinking about innovation is more widespread in the industry than in academia, and has not

Problem	Solution	Unique Value Proposition	Unfair Advantage	Customer Segments
Top 3 problems	Top 3 features	Simple, clear, compelling message that states why you are different and worth buying	Can't be easily copied or bought	Target customers
	Key metrics Key activities you measure		**Channels** Path to customers	

Cost Structure	Revenue streams
Customer Acquisition Costs	Revenue Model
Distribution Costs	Life Time Value
Hosting	Revenue
	Gross Margin

PRODUCT	MARKET

Figure 1: The empty lean canvas, based on Osterwalder and Pigneur (2010, p.15).

been tested properly on journalism-oriented academic prototypes.

In searching for a sustainable business model we adopt a further methodical tool from the industry: the "lean canvas," a strategic business visualization template and modeling tool. The lean canvas is an adaptation by Maurya (2010) of the popular Business Model Canvas by Osterwalder (2004), born from his PhD thesis on business model ontology and disseminated in Osterwalder and Pigneur (2010). We adopt the lean canvas (Canvanizer, 2015), since we find it more appropriate for our specific challenge of bringing to the market academic prototypes for journalism. Nevertheless, it is perfectly possible to adopt the Business Model Canvas instead with very little adaptation.

The canvas represents the current hypothesis of the business model and its underlying assumptions, and they are all specified in relation to each other. For example, the box for cost structure is mirrored by the box for revenue streams, and ideally the revenue should be higher than the cost. By aligning the development process with the lean canvas the team progressively validates these assumptions and updates the business model. It all starts with an empty canvas as shown in Figure 1.

Each of the nine boxes in Figure 1 represents a necessary element in the overall business model. If the innovation process starts from the canvas, the development team is supposed to creatively propose better and better ideas for the necessary boxes. At the right time in the process different elements can be tested experimentally, to "stress" the model and try to identify weaknesses in it. "Fail fast" is a slogan for validated learning – the systematic gathering of empirical information about how the product would be received by various user groups. You may have the wrong solution to a real problem, or a good solution to a problem nobody has. We will flesh out the details of how to use the canvas in the main section below.

We expand on the lean startup method by prescribing additional guidelines that aim to help orchestrate the balance between communicative values and economic values, while in search of a sustainable business models for media ventures. Nevertheless, the goal is not to re-invent the lean startup method or its principles, but instead to use it as is, while introducing guidelines and recommendations that will complement it for the specific scenario we address: bringing academic prototypes to market.

The methodology must be practical in relation to how meetings and negotiations normally take place. The steps below could be promoted by a university alone, or as a shared methodology among a university and media companies collaborating in a cluster.

1. Identify existing academic prototypes in the university.
2. Contact academic teams for each prototype and fill out the canvas 0 from an academic team perspective.
3. Book a date and invite industry companies to a session where academic prototypes and corresponding partially filled out canvas 0 are presented.
4. Agree with companies to start a three-month task force team to take the selected prototype(s) through the methodology. The rules of engagement for the task force are described in detail below.
5. After three months the task force presents their validated business model findings for the company to evaluate.

The task force team rules of engagement are established to support the discovery of a sustainable business model within a specific timeframe. This team is responsible for taking the prototype to market by proposing, testing, and developing successive business models while negotiating the necessary tradeoffs as the original prototype transforms over time. In addition, we introduce communicative values, such as truthfulness, as "semi-fixed" key metrics within the business model canvas. The key metrics section of the canvas shows what should be constantly measured and monitored, and is closely related to the shared definition of success the task force creates over time. As we will see later in this paper in the PediaCloud example, we introduce the communicative values of truthfulness, actuality (space), and user anonymity in the key metrics section of the canvas. This stresses the importance of keeping communicative values as core to the initial business model, with the goal of reducing the impact on these as the discovery process moves forward as much as possible.

We use the lean canvas to represent a successive business model hypothesis for a future emerging service or product, testing the riskiest assumptions of our hypothesis through experimentation in a systematic time-boxed way. As we run our experiments we increase knowledge and therefore decrease risk, progressively tuning our business model towards a sustainable one.

The task force systematically tests and updates the business model, running structured experiments in a validated learning loop. Each version of the business model update is represented in the lean canvas and versioned (i.e., as canvas 0, canvas 1, canvas 2, canvas N). Communicative values are included in the key metrics section of the canvas to keep these as core metrics of success as the business model discovery process moves forward. The task force's job is considered done when a sustainable business model is discovered during the defined timeframe or the timeframe expires.

The exact definition of what sustainable business model means should be made explicit as the project begins and as the task force team is established. Sustainable does not necessarily mean profitable, as industries can be complex machines that by taking loss in certain units actually create gains within the overall system. We define a sustainable business model as the business model that the company wants to execute and is capable of autonomously taking forward as the task force dissolves, while maximizing the retention of the original prototype's (journalistic) communicative qualities.

SCENARIO WHERE THE PROPOSED METHOD IS APPLIED

In this section, we hypothetically apply our proposed guidelines to an academic team and a journalism company. Since it is partly based on prototype development, it can be considered a *prototype scenario* of journalistic innovation in the Norwegian media sector.

The scenario involves an existing prototype, PediaCloud, created by an academic team at the University of Bergen to display geo-located Wikipedia information in word clouds on Android smartphones. In the scenario the academic team wants to transform this prototype into a service that is useful for a news service in Media City Bergen. In the scenario we pursue a hypothetical collaboration with the newspaper *Bergens Tidende*. This company is vital to the health of the public sphere in Western Norway, a partner in Media City Bergen, and like most other news companies it has been downsizing and reducing services all through the 2010s. It is a victim of the same dramatic downturn as the rest of the legacy news businesses.

Bergens Tidende, founded in 1868, is the largest newspaper company on Norway's Western coast, with a daily print circulation of 73,640 copies (2014). The editorial headquarters are in Bergen, Norway's second largest city. Across all platforms, the media house reported 312,000 daily readers in 2014. The company also operates one of Norway's most read regional news services, the online news site BT.no. Altogether, media products by the Bergens Tidende group reach approximately 70 percent of the adult population each day in the greater Bergen area. The Bergens Tidende group has approximately 220 employees, but is regularly laying off employees and shrinking in size. *Bergens Tidende* is a leading advertising outlet in Western Norway, and according to the company it is the local leader for advertising of real estate, travel, recruitment, travel, and cars.

The academic prototype PediaCloud can be adjusted to suit the needs of the local and regional news provider *Bergens Tidende*, while retaining its basic communicative values as it transforms from invention to innovation.

The basic functionality

It is necessary to explain the details of how PediaCloud works. It uses word clouds for the graphical display of locative information in the shape of text and photos relating to a particular place. Word clouds (Rivadeneira, Gruen, Muller, & Millen, 2007) is an alternative approach to accessing location-based information from interactive maps, which is the most common practice today. PediaCloud provides a word cloud for one's location, and further links the words to Wikipedia articles. In addition to reading the Wikipedia entries, users can re-center the information probe by getting a topical word cloud weighting the located information content in relation to that particular word. This results in word cloud visualizations that could bring the user into a variety of location-oriented topics. An example is shown in Figure 2.

Figure 2. Screenshots from PediaCloud's display of information about "Bryggen" in the center of Bergen.

PediaCloud's usability has been tested empirically. The academic team did a traditional user testing study in 2014 in London, a big city with a large amount of located information, with eight participants from the city (Tessem, Bjørnestad, Chen, & Nyre, 2015). The data collected indicate that PediaCloud is experienced as an explorative locative service, where users discover nearby information by coincidence rather than after searching for it instrumentally.

The study by Tessem et al. (2015) revealed some patterns regarding how this particular set of users felt about the *serendipity* of PediaCloud. The informants actually found this serendipity to be the core function of the app. One of the respondents commented, "I think its unique selling point is the randomness about it. It's just stuff that you wouldn't really be thinking about. I suppose someone else could say 'Why would I care?' but that's what PediaCloud is" (Tessem et al.,

2015, p. 267). Another informant said, "PediaCloud is more fun than functional. I see it more as a learning and leisure thing, than a functional thing" (Tessem et al., 2015, p. 267). The researchers concluded that PediaCloud can be considered a *serendipitous search approach* (Foster & Ford, 2003), giving the users information in a manner that can be considered fun, surprising, and interesting.

Information about the users' actions is of great economic value to commercial actors, because they can use this information to personalize and contextualize their service regarding, for example, news, advertising, and recommendations. This means that tracking could have been a major selling point for PediaCloud. However, the academic approach was guided by an ideal of anonymity for the users, in respect for their privacy. PediaCloud therefore refrains from logging users' locations, and keeps their privacy and anonymity intact throughout the communication process. Privacy is under duress in all sectors of the media business, and anonymity might be difficult to sustain as part of the business model for a new version of the technology.

In summary, PediaCloud has a distinctly academic value orientation. It promotes truthfulness of information, context-sensitivity, and anonymity for the reader, and a serendipitous presentation that appeals to curiosity and learning. Such values are fundamental to academia.

The academic team partially fills in canvas 0

In our hypothetical scenario, the academic team considers PediaCloud to have real potential as an innovation project in the field of journalism due to its innocent, fun functionality, provisionally called the "serendipity engine."

In order for PediaCloud to become more than a shelved research project, it must be activated in the real news industry. The academic team must take an initiative towards a commercial partner. In our scenario, a regional legacy medium such as *Bergens Tidende* is a possible collaboration partner, and the academic team should make contact equipped with the canvas and other documentation of how the prototype works. It is important to note that the academic team is the prime mover of the collaboration.

The first application of the lean method consists of filling out the canvas as it would look relating only to the original value proposition of the prototype. The academic team can partially fill in canvas 0 and take this as input into the task force (Figure 3). This version will presumably be influenced by the communicative values shared by academics and journalists.

The academic team starts by filling in the boxes in the canvas, naturally focusing on the Solution section. Since academic prototypes tend to be market agnostic, these usually are very experimental in focus and present proposals of novel interactions and technological possibilities exploration. The initial Unique

Problem	Solution	Unique Value Proposition	Unfair Advantage	Customer Segments
	- Word cloud based discovery - Locative articles based on Wikipedia - Algorithm that relates structured data based on proximity, uncovering new connections	- Re-discover the world around you in a new surprising way - Named "PediaCloud"		
	Key metrics - Truthfulness - Actuality in space - One-way address to anonymous users		**Channels**	
Cost Structure			**Revenue streams**	
PRODUCT			**MARKET**	

Figure 3: Canvas 0: The academic team partially fills in the business canvas. Cost structure and revenue streams are empty at this stage

Value Proposition is also filled by the academic team based on the feedback from the usability study of the prototype. Finally, in Key Metrics, the academic team selects their communicative values as the features that should be measurable. These are the communicative values, beginning with truthfulness, that should be retained from the academic prototype as

a viable business model is discovered and the prototype transformed accordingly. The sections of the canvas that deal most explicitly with economic values remain empty, as this is something the academic team neither prioritizes nor understands very well.

PediaCloud would presumably be fruitful for the spreading of truthful information with high geo-

graphical relevance and anonymity for the user. But notice that PediaCloud does not support all the values specified in the theoretical section above. It would not be true to say that it presents news with *actuality* in time (like breaking news, updates, etc.), neither does it have editorial *independence* or democratic *relevance* in any professional sense.

The task force finishes filling in canvas 0

Initially, the company only makes a yes or no decision; they either find something interesting in the proposal and decide to engage, or they remain unimpressed and politely reject the proposal. But given a "yes," the academics then continue by reconceptualizing the app for the legacy medium *Bergens Tidende*. While we interviewed employees in *Bergens Tidende* for a new study, and were allowed access to their online news archive to experiment with locative news for the new iteration (Tessem, Karlsen, & Nyre, 2016), we did not enter into a real task force relationship with *Bergens Tidende*.

In our prototype scenario, the task force's mandate is to make adjustments in the PediaCloud prototype in light of the needs of an online distributor of written news. The team agrees on a short-term deadline for the project to reach validated learning about a sustainable business model. The task force begins by filling out the remaining sections of the canvas 0 (Figure 4). Note that the goal of this first exercise is

Problem	Solution	Unique Value Proposition	Unfair Advantage	Customer Segments
- Weak solutions for geo-tagging of news content, cannot exploit the potential for added value - Have readers spend more time navigating on site (more impressions/ more ad exposure) - Re-use and re-monetize pre-produced content/ archives	- Word cloud based discovery - Locative articles based on news archive - Algorithm that relates structured data based on proximity, uncovering new connections	- User: Re-discover the world around you in a new surprising way - Customer: Increase impressions and readership time on your online newspaper while keeping your current level of content production - A catchy new name suitable for *Bergens Tidende* - High-level concept: Relevant news everywhere	- Access to internal news archive and large daily output of news	- Customer: Newspaper - Customer: Advertiser - User: Non-subscribing readers/ curious readers
	Key metrics [Communicative values] - Truthfulness - Actuality in space and time - Editorial independence - Democratic relevance [Economic values] - Session time per reader - Increased advertising revenues		**Channels**	

Cost Structure	Revenue streams
PRODUCT	**MARKET**

Figure 4: Canvas 0 – The task force fills in all the boxes in the business canvas. Cost Structure and Revenue Streams are still empty

not perfection or to spend too much time arguing for specific details. The goal is to get the team to agree on a "good enough" business model with a hypothesis that looks viable.

Note how the customer segments are defined and the overall canvas transforms, while retaining as much as possible of the original communicative values. The Key Metrics section is important, and there is a notable difference from the academic version, namely that a number of communicative values are added due to the fact that *Bergens Tidende* is an independent regional newspaper. However, the ideals of privacy and anonymity are not brought forward into the new version. In today's business world, personal information is very valuable, and the new app is required to register information about the users. The task force also gives the app a new name that corresponds with the new purpose, namely "NewsCloud" (Tessem et al., 2016).

Testing the riskiest assumptions

The metric approach to value is absolutely critical while filling out the canvas 0, setting the stage for running through the lean startup methodology in a way that orchestrates the economic and communicative values of the innovation.

The first canvas (canvas 0), after being filled by the task force, would serve as a basis to select the riskiest

assumptions and design the experiments to validate these. As defined in the lean startup method, to discover a business model that works, the task force will progressively select the riskiest assumptions in the business model, and run suitable experiments with test users to validate these assumptions, and according to the new insights the team will make necessary adjustments to the model.

Looking at canvas 0, the task force could potentially identify as the riskiest assumption that most of *Bergens Tidende* articles are already localized today, and with the necessary metadata for a proper functioning with PediaCloud. To test this assumption, a simple experiment could be conducted, for example, by interviewing/partnering with those in charge of the *Bergens Tidende* articles database system and/or running data compliance tests with a sample of the same database. Here we can see how critical it is to compose the task force with members from the academic team and the company. This setup makes it possible to launch and run these experiments with the task force members pushing for the needed experiment resources as the project advances.

If this assumption fails, it could be too costly to do the necessary data adjustments and standardization to pre-existing articles. This could be the case if for example the news archive would require many hundreds of hours of work geo-tagging articles in order to

be usable for NewsCloud. Due to such disadvantages the team may have to pivot – i.e., to make a structured course correction designed to test a new fundamental hypothesis about the functionality or business hypothesis or both. If the assumption fails but there is a low-cost solution that is able to localize articles at a high level of precision, then the business model could be adapted to include this in the costs section while remaining relatively intact.

The task force must test the assumptions in the business model, and we call this Experiment 1. In this scenario, the task force adapts the PediaCloud functionality to present *Bergens Tidende* articles instead of Wikipedia posts, and as suggested the new prototype is called NewsCloud. The riskiest assumption to test is that articles in *Bergens Tidende* are geo-tagged or can easily become geo-tagged. The team takes *Bergens Tidende* articles from 2012 to 2015 and integrates these with the prototype, creating NewsCloud. The success criterion is that a large number of articles should be geo-tagged. Unfortunately, in this scenario, a first analysis showed that most articles in *Bergens Tidende* do not have any metadata or geo-tag information that can easily be processed.

The task force, in response to this finding, develops an algorithm that locates each article based on geographical names occurring in the articles, and modifies the word cloud by adapting the algorithms

so they fit optimally with journalism content as opposed to Wikipedia content. In addition, the task force develops new functionality where the users can select a preferred year and filter the presentation of articles.

The functionality of NewsCloud is shown in Figure 5 where we see word clouds and article lists for the same location as in Figure 2, Bryggen in Bergen. The located cloud shows lots of words particularly relevant to the development of a light rail along the UNESCO site Bryggen which was an important local issue in 2015. In particular we see politicians' names (for instance Dag Skansen, a conservative politician). Further, the five articles listed are all about the same topic, and a related topics word cloud for the article "This is not House of Cards" (*Dette er ikke House of Cards)* is even more focused on this particular political discussion (Erlend Horn, for instance, is a Liberal Party politician).

The NewsCloud app resembles the former PediaCloud by providing location-based actuality and serendipity for the reader. In addition, a selection of articles from the news archive can be filtered by year. It could be further improved to allow for selection of "today," "this week," or other time stamps.

Returning to the purpose of Experiment 1, we can now see that the task force was able to verify the assumption that PediaCloud can be translated into a

Figure 5: The screenshots show the display of news articles in NewsCloud (now renamed from PediaCloud) when located at Bryggen in Bergen. They are also presented in Tessem et al. (2016).

news service. A large number of articles can now be handled using the academic prototype's algorithm.

Following the methodology, the next step is that the task force updates the business model canvas, going from canvas 0 to canvas 1, selecting a new riskiest assumption and repeating until either the time frame and mandate expires, or a sustainable business model is discovered. A potential candidate for a next experiment could be the assumption that the proposed user navigation model increases the reader's time spent on-site and on-app. The task force could apply the algorithm to a simple A/B test. A selection of *Bergens Tidende*'s news can be delivered to two different reader groups, where group A experiences it with the algorithm on and group B with it off. The session time and cross-article linking could be measured and
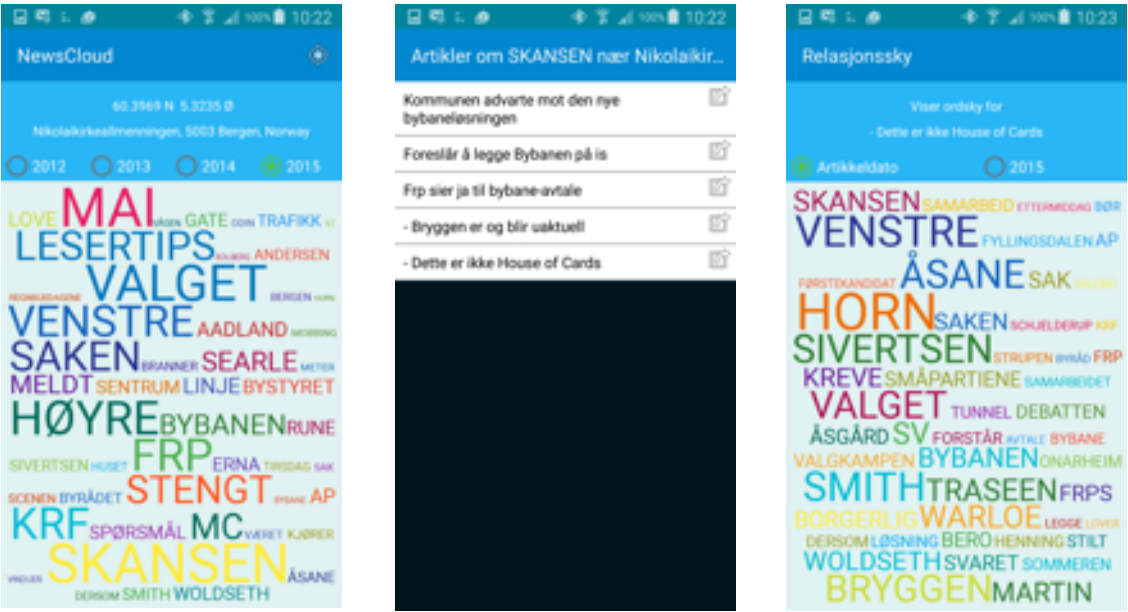
compared. The success criterion would be that users from group A should spend at least 10 percent more time on-site per session than the users from group B.

CONCLUSION AND FURTHER RESEARCH

The main strength of the approach presented here is that the task force will acquire validated learning of a precise nature that it can apply in new projects. This quality is assured as long as the task force explores the riskiest assumptions unflinchingly during the three-month period. Even if the project deadline comes before a sustainable business model has been found, and even if the project is heading towards certain failure, the partners will learn something useful. Both the university and media company will acquire fresh, validated knowledge that can reinforce their individual strengths, and increase the odds of future projects finding the right tenor of collaboration and identifying sustainable business models.

In closing, we will address the generalizability of this approach. Universities are the prime mover in this innovation strategy, since researchers and students are after all the creators of the primary academic prototype that is supposed to be brought to market with a suitable business model. Our approach fits well with the contemporary value orientation of universities, and the expectations towards universities from the larger society. Universities in Norway have an obligation to produce research and disseminate their findings. In regard to innovation, there is a strong value system called Responsible Research and Innovation (RRI) emerging from the European Union. According to RRI the research team must consider the ethical acceptability, sustainability, and societal desirability of the designs they create (Von Schomberg, 2011). This type of reflexivity is not the only feature of RRI. Stilgoe, Owen, and Macnaghten (2013) argue that the team must be inclusive and responsive to the general public, and that anticipation of future needs and requirements are important. Our approach clearly has affinities with the RRI paradigm, and further research could elaborate on the relationship.

There is quite a lot at stake if seen from a Norwegian perspective, and a new influx of academic prototypes into the media sector would stimulate innovation. It should be noted that the innovation sector in Norway traditionally is not very strong. Sørensen (2010) argues that innovative technologies are mainly invented in the United States and assembled in China. Norway imports one innovation after the other, and adapts them as well as possible. Most of these technologies are created for urban areas, while Norway is a small and mountainous country in the global context. Sørensen (2010, p. 84) argues that it is therefore crucial to have adaptations specifically for the Norwegian situation. He writes that if new competencies are learned and taught, and they are suitable for the natural, economic, and cultural settings of Norway, these adaptive skills can in the next round create a national level of competency that is competitive in an international perspective (ibid.).

In order to accomplish such ambitions, the best strategy in the short term is to apply for money from Innovation Norway or Horizon2020. It is however difficult to be successful in these competitive contexts, and therefore we end with three directions of further research that might strengthen the approach and make it more likely to be successful in bids of various types.

1. Team collaboration. There are significant differences in the attitudes and values of academic milieus versus business milieus. We believe it is possible for a project to strike a balance between academic and economic interests. Since this article is written by two academics and one startup representative, it serves to prove that it is possible to communicate rather well across the divide, and that it can be fruitful to work as a combined task force. It would be very useful for future collaboration if the best practices communication skills were understood and taught to others.

2. Validated knowledge. It is important to find good ways of handling the knowledge about assumptions and risk that was acquired in each business model experiment. There can be internal ecosystems with activities and practices growing and becoming more professional. Validated knowledge is useful for identifying best practices for the task force itself, and

for other tasks in the university and media company.

3. Innovation management. Among the important features to govern are copyrights, IP, patents, and publications, and since the negotiations will involve academic and industry partners, with widely different cultures, this will be a vulnerable aspect of collaborative projects. There must be a plan for how to manage the rights and properties of the actors involved in the project, and also of members of the innovation cluster.

These directions of research would presumably lead to a stronger method for academic media innovation, with a stronger ability to contain the original qualities of the academic prototype in a validated journalistic market.

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