

Science Fiction Prototypes in Educational and Business Settings

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Abstract

This paper examines the intended purpose of Science Fiction Prototypes (SFP) in conjunction with the significance and use of workshops in business education. We explore why the SFP as a form of education delivery has proven to be popular. Finally we argue that the merits of alternative delivery methods, including the use of science fiction prototypes within different venues or alternative delivery methods can enhance educational engagement with broader audiences outside the traditional classroom setting.

Keywords. Science fiction Prototype (SFP), business education, non-traditional classroom setting

Introduction

To date, Science Fiction Prototyping practice has largely focused around delivery within classroom style workshops or as role playing activities. The tendency within this current practice is to merge two distinct 'parts' of a Science Fiction Prototype; the first, the creative creation of the science fiction prototype introduces a vision or projection of future conditions while the second offer up the prototype for interpretation and encourage participants' to attempt to strategise and operationalise the vision (Figure 1). In this paper we re-examine the intended purpose of Science Fiction Prototypes in conjunction with reflections upon the significance of case studies in business education and the reasons why this form of delivery has proven to be so popular. Finally we argue for the merits of alternative delivery methods such as, for example, the use of science fiction prototypes within a digital shopfront to enhance educational engagement with broader audiences outside the traditional classroom setting.

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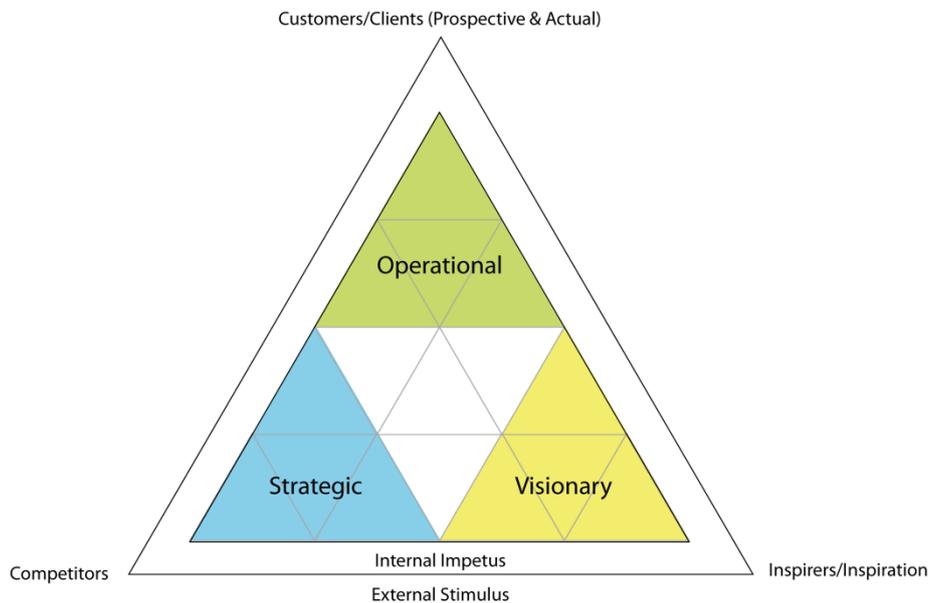


Figure 1: The relationship between visionary and operational aspects of an organisation that are captured within the two parts of the Science Fiction Prototype.

1. Discussion

The case study in business education is a well-established and regularly used practice. At the core of its many claimed benefits, case studies enable the educator to achieve learning objectives that draw upon recognisable but systematised real-life situations. These are situations that are regularly presented as examples of success with the implication that these are the models to follow in other contexts. Argyris (1980) has, however, outlined the benefits of the case study approach as a means for introducing and hearing the views of others; confronting differences; making decisions; and becoming aware of the complexity of reality. Overall the claimed benefits of case methods recognise that there are rarely right or wrong answers and that cases are invariably as incomplete as real-life situations. For all these apparent benefits Argyris (1980) also outlines a critique in the use of case studies. Case-based teaching methods are regularly used by faculty "stars" as their preferred method for management development programs as it facilitates learning that does not question the underlying values of the executives described or the policies in their organizations. At the same time the case study inhibits learning that would enable learners to question their basic assumptions and to improve their application of new learning within their current or future organization. Levi-Strauss (1969, p.18) makes a similar observation regarding cultural practices more broadly, "There is rarely any doubt that the unconscious reasons for practicing a custom or sharing a belief are remote from the reasons given to justify them." Science Fiction Prototyping pushes this remoteness that Levi-Strauss observes to an extreme position where it can become more clearly evident.

In contrast to case studies, which focus upon historical evidence drawn from actual events, science fiction prototypes develop a future extrapolated from the authors' experiences and knowledge of the present. The vision that is presented through the prototype emphasises the concerns and interests of its author(s). This reversal of perspective arguably offers greater opportunity for the critique of current environments and practices and follows in the spirit of the science fiction genre's longer-term tradition for assertive social and political commentary. The prototyping approach also highlights the separation of two distinct activities that are often merged without acknowledgement in other teaching and learning methods. These two activities can be broadly described individually as the creative and operationalising parts of the whole prototype. The authorship of the prototype is a creative activity that can be an entire workshop itself, part of a series of activities or a discrete workshop with the output then becoming the input for a separate later workshop with entirely different audience and purpose. This is what Papanek (1997: 307) describes as "the omni-directional net of several design 'events'". His perspective highlights the relationship of one event to another by implying a sequential process where alternatively there are a contraction of ideas to a collective consensus or special case followed by the expansion of ideas from a single starting point to a multitude of possibilities. Different sequential design events cycle through this contraction and expansion of ideas (Papanek, 1997: 309). Alternatively, Wu (2013), in his work on SFP imagination workshops, advocates an evolutionary model in what he terms 'cyclic SPF'. This model has a series of processes containing feedback loops in the form of an iterative co-creation process that can include a range of deliverables such as product specifications or business models (Wu 2013).

To date, science fiction prototyping activities have often focussed on the creative parts of the prototype with an implicit goal to 'build something' through the activities (Egerton 2013; Johnson 2011, 2013). Although, as previously acknowledged, Wu (2013) has broadened this vision to create more 'intangible' prototypes. In Papanek's (1997) terms this is a contraction event. The focus on creation reflects the desire of earlier SFP workshops to invent and create new technological and physical artefacts. What could be described as the science of science fiction prototyping? In contrast, we focus here on the less explored aspect of science fiction prototyping that is concerned more with the business of science fiction prototyping. This can be identified (see Figure 1) as an attempt to move from the vision of the prototype to the operationalisation of the prototype and ultimately the potential implementation of the vision. In order to achieve this focus on strategic and future operational issues, the creative part of the prototype for this workshop has been pre-prepared. It draws upon discussions by the authors and, perhaps inevitably, reveals some of their own current interests and awareness. This story is consciously written for science fiction prototyping in its description of a future world in a matter-of-fact style with details that provoke questions rather than providing direct explanation. The purpose then of this prototype is not necessarily to "invent something" from the description of the prototype but to elicit discussion around how to get from a current situation - the present environment - to the vision outlined by the prototype (if, in fact, the described environment is actually considered a desirable situation). The operational workshop - an expansion event - itself then benefits from participants' varied knowledge and specialisms to bring the operational and strategic elements to the aspects of the vision that are already described by the prototype.

We also problematise here, the choice of venue for a workshop. Workshop locations are often an indicator of the approach and intentions of the organisers. The perceived privilege of universities and their distancing from everyday life is commonly represented in the 'ivory tower' description. Yet the choice of workshop location, such as a university building, is usually a matter of convenience for the organisers rather than a conscious selection. Very rarely does a workshop break out of this orthodoxy. One example, a workshop held during the Abandon Normal Devices (AND) Festival was located on an open piece of rough land in the centre of Salford (AND Festival 2010). A venue that could generously be described as, curious. Hosted by Heath Bunting the icebreaker involved throwing rocks at cans and the main event placed the attendees in a simulated air-drone attack that was enhanced with the inclusion of remote control planes and cameras. Similarly, the Rochdale Borough High Street Foundation (2011), with a concern for the number of empty shops in the borough, located their urban planning workshops in an empty shop within a central local shopping centre. Music, theatre and dance were used as inspirational stimuli for the attendees to assist in building an alternative vision of their high street. The intention in both of these examples was to encourage participation from within the locality and purposely drawn away from convenient academic locations.

We describe these combination of factors for consideration as a parallel set of sliding scales (echoing Papanek 1997: 176). This view presents a multitude of combinations (Figure 2) that both charts the approach we are advocating here through the use of Science Fiction Prototyping while also highlighting the relatively small range of combinations that are currently used in conventionally teaching and learning practice.

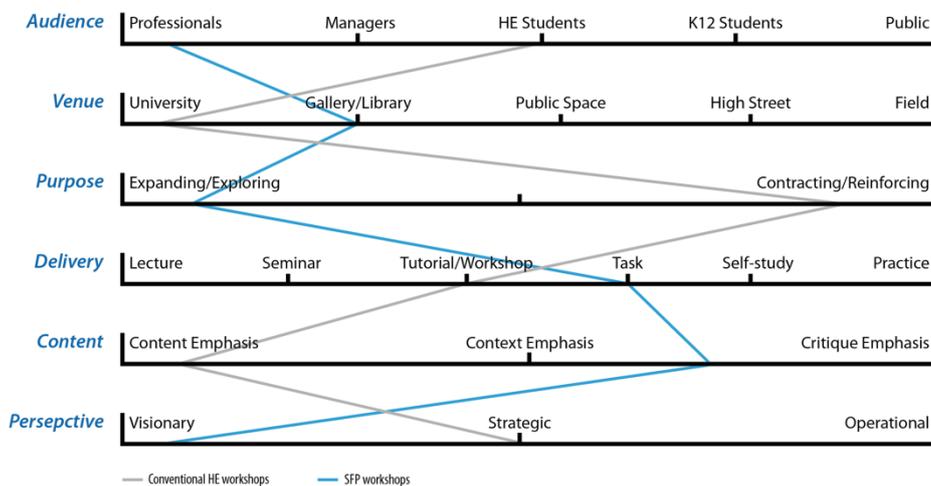


Figure 2: Sliding scales of the comparative design and pedagogical concerns of teaching and learning activities

The following Sci-Fi narrative provides a platform for audience participation to develop an operational prototype (or prototypes) that encourages an imagined future to be achieved. The story has been written to stimulate participants' thinking around a range of key issues and provides a framework world for future imaginings. By writing the narrative as a framework rather than a complete 'whole' story supports attention to

the parameters identified in Figure 2 but particularly by enabling a contextualising of Audience, Venue, and Delivery. These, we argue, are the three variables that are most likely to differ within Science Fiction Prototyping workshops. Different workshops will inevitably produce different responses but this emphasised awareness on structural differences provides the basis for comparisons of the results. Workshops that are undertaken with some form of advocacy as a stated outcome, rather than solely educative intent, also benefit from understanding the different bases from which the prototypes emerged.

The story itself depicts a futuristic scenario where money (as we currently understand it) transcends its physicality within a limited financial domain; the notions of 'work' and 'labour' have become increasingly broad to the extent that a contemporary reading might describe these activities as games; and the current conventional arrangements and balance of transport and logistics coupled with manufacture have completely altered. The consequences of these changes have repercussions within the framework world with the hint that there are also shifts in attitudes and cultural practices. The narrative also hints at a more definitely stratified society. These devices all build a framework without being conclusive or definitive about the future. There is no single final conclusion, singular explanations or closed endings. It is a prototype of potentiality. Importantly the narrative does not prejudge the future world framework as being either utopic or dystopic. This judgement rests entirely with the reader and will be among the influences that shape their contribution to the workshop. The operational prototypes that emerge can then just as equally resist or embrace this future overall. More sophisticated prototypes can also identify individual elements of this future world as potential directions to avoid or actively work towards. This potential attends to the need to operationalise and strategise vision (Figure 1) in ways that are achievable and sustainable. Equally, and in direct contrast to the use of cases and case studies in business education, the potential bifurcation of workshop results recognises what Chesterton (1915) described as the fallacy of success. By presenting a framework that does not presuppose the desirability of the future described within the narrative there is no presupposition that the resulting future is itself a successful outcome - albeit necessarily using the judgement and perspective of contemporary experience.

2. Sci-Fi Narrative: "The New Day"

Matthew74NT@dmail stood waiting for the robo-bus. It was still relatively early and Matthew74NT, or "Ant" to his friends, was in a contemplative mood. The heady result of a combination of early morning caffeine shots and the after-effects of late night alcohol shots. It was too early for the smart streetcars to be out so Ant shared the street with just a few energetic cyclists. Almost unnoticed in the background there was the inevitable presence of the street-collecting machines carrying away the remains of everyday life from previous generations that continuously emerged onto the streets. The rush hour - unlike the detritus - was most definitely a thing of the past. Ant gripped his tablet more tightly towards his chest. Despite the evidence of the grey skies and drizzle, today was not any ordinary day and it was a day that Ant had hoped would never happen. He was waiting for the #79 robo-bus. Of course, waiting for robo-bus

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wasn't the event that Ant had hoped would not happen to him. He might not be a regular traveller on public transport but nor was it the cause for his apprehension.

For the first time in his life Ant found himself unemployed. Standing at a bus stop waiting for the next robo-bus is always a time for reflection and Ant was no different. Up until five days ago he was a relatively successful member of the TwP Guild in the *World of Accountancy*. After a shaky and slow start 10 years ago as a newbie student Guild member Ant had reached chartered level 22. He had even been dreaming of making the big jump to partner level 1. The steady downturn in genecoin production in the past two years had been hitting hard. All of the large guilds in the *World of Accountancy* had shrunk their membership. The overwhelming control that they exerted over accounting practice worldwide made it difficult for individuals to progress in the world significantly and the ability to earn genecoins without the support or protection of a guild was very limited. Ant did admittedly have a ghost account that he had used to get a few extra genecoins but in his alter-ego as a part-time associate level 4 this was really just enough for a few extra luxuries.

Ant absentmindedly checked his watch and instantly recognised the futility of this action. While he normally avoided the robo-buses he knew - as well as everyone else - that one of the effects the genecoin crisis had brought was a revision of robo-bus services. Each robo-bus on each journey plotted an individual route that optimised the number of passengers it carried. Although the mechanics of the bus system was a secret, speculation was rife about how it actually worked. Some suggested it was based on weight sensors and cameras measuring the number of people waiting at each stop while others said it was simply based on calculations and extrapolations from previous journeys. Rumours also abounded on the local blogs that the bus services were constantly being tweaked to give preference to the filling of robo-buses to capacity rather than passenger convenience. This suggestion was not a surprise to anyone.

Ant sighed quietly at the frustrations of public transport. But he was also relieved to see two others walk up to his bus stop.

Sure enough only minutes later a robo-bus appeared on the road heading towards Ant and his unknown travelling companions. Behind him the man and woman chatted. Their tone was hushed but urgent. Ant tried not to listen out of a sense of privacy and politeness but snippets inevitably came clearly within his earshot. "Fantastic new blog", "actually printed?", "genecoin crisis".

The robo-bus arrived. Ant swiped his accesscard on the door and keyed in his destination. He cursed quietly under his breath. Someone was sitting in his favourite seat. Despite only travelling rarely on the robo-buses, Ant enjoyed the pleasure of sitting in the 'driver's seat' of the robotic driverless buses. It was a simple joy even though the concept of a human bus driver was something Ant only knew from the stories of his parents and grandparents. For Ant there was a nostalgic appeal in having a bus driver to speak to and although he had visited street-collector exhibitions in the past he still felt that there was a massive gulf between seeing the collected items on screen and actually speaking to a driver.

In the perverse logic of bus seating the couple from the bus stop had taken up the seats directly behind Ant. Their conversation had continued on apparently the same topic with some intensity. "Change of government." "Getting the message out there." Ant

sank back again into his own thoughts. He was visiting Andrew38EN@keycorp, or somewhat predictably Ben. Ben was a friend, perhaps more accurately an acquaintance who had been a friend at college. Ant had reinitiated contact with Ben through a mutual friend the day after he found out that he had lost his place at the TwP guild. Knowing Ben was useful as he had influence in the HDC Guild within *Logistics World*. Or at least enough influence to get Ant a foot in the door at the Guild with the opportunity to start at student level 6. Ben had offered to guide Ant through the *Logistics World* for a couple of days. Although it was unusual Ben had suggested to Ant that he should visit him at home to meet face-to-face and walk through the world together. Ben had expressed surprise at Ant's desire to change career and wanted to ease him into things. It was still unusual for members of guilds to completely change professions. Most of the victims of the genecoin crisis had stuck to their original careers as it was generally easier to progress back to their original levels fairly quickly. Knowing all of this Ant had readily agreed to Ben's offer, glad to be out of his own flat for a while and away from the reminders of his former guild - the awards, certificates and gaudily coloured paraphernalia that he had printed and collected over the years.

The robo-bus stopped and Ant realised he was already outside Ben's house. A quick Tx and Ben opened the door. Ant and Ben awkwardly shook hands. This was the first time they had stood in front of each for many years. However, both recognised the other immediately from the various images on their walls. Ant had already got himself up to date with Ben's career and family through his wall. Nonetheless they chatted casually for a while as Ben tried to shuffle his eight-year-old daughter out the door. Her school group were having a meet-up today at a neighbour's house and her combination of excitement and nervousness at the prospect of something different meant that she was running late. Ant discovered that Ben's partner, Mary27UC@outward, had already taken a robo-bus to a colleague's house to give Ben and Ant a chance to work together undisturbed on Ant's first day at his new job.

With the departure of Ben's daughter some calm returned to the house. Ben turned to Ant and in a tone that was both a question and a statement of the obvious, "To work!?"

Ben and Ant logged on and the *Logistics World* screen came up. Ben explained, "*Logistics World* is a relatively simple interface. Our task is relatively simple too. We have to shift the coloured cubes from their current locations to empty spaces that flash when you move the cube. You are starting on the student levels so the size of the cubes you can move are small but the more you move and the more you work with the guild to move larger cubes you will level up. If you are efficient and move cubes in bigger groups and the minimum possible distance the guild leaders will noticed this in their weekly reports and you will get support from the guild. Obviously you receive a payment for every cube you move."

Ant nodded appreciatively. This felt familiar but he was puzzled by the purpose of the work.

"How does the movement of the cubes relate to logistics?" Ben looked over at Ant. He had been intently staring at his own screen throughout his description. He could see from the expression on Ant's face that this was a question that came out of genuine interest. Ben realised that Ant's previous experience in the *World of Accountancy* had been a bit more - for want of a better word - conceptual. Although Ben had never seen the *World of Accountancy* interface he had always guessed that it mainly involved moving numbers around. Ben patiently continued,

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“Oh, each cube relates to different printer supplies. Each colour relates to a different type of supply. I’m not 100% sure but I think the pink and brown cubes are protein and carbohydrate supplies for food printers and I’m pretty sure that the bigger silver cubes are raw graphene of some sort. As you guide the cubes around you are controlling the delivery floats and airtubes between the factory and their destination. Somewhere in the docs there is a full chart of all the item types. Honestly in all the time I’ve been working I’ve only seen about half of all the possible types.”

“What’s that small disc?”, Ant was enjoying the shock of this new world.

“You haven’t changed”, Ben grinned. Working with Ant was bringing back memories of their time at college together. “The disc is a genecoin. They’re not rare but they come in lots of different colours. I think the miners customise them as a sort of branding but it also seems to be connected in some way to the source of the genecoin. You won’t be able to move them until you’ve hit the chartered levels AND gained a gold security badge. But don’t worry,” Ben looked directly at Ant, “there’s no penalty for trying.”

“I didn’t know you could see genecoins like that. In the World of Accountancy it was a bit more about making the numbers go together. We were always told that genecoins were all basically the same. Same exchange value, interchangeable, unchanging.” Ant’s fascination was coming out in the tone of his voice and he could feel himself being drawn into the mechanics of *Logistics World*. “I think I’m going to enjoy this.” Ben smiled,

“Well it’s always a better day if you actually enjoy your work.”

Ant and Ben toiled on silently. Occasionally they exchanged words around work and life in general. Then Ant in a moment of revelation suddenly exclaimed,

“This all looks oddly familiar. In college didn’t we use to play a retro-game from years and years ago that was a bit like this?” Ben smiled,

“Take a look in the license statement and scroll all the way to the bottom.” Ant did as suggested, scrolling past lines and lines of revision dates and patch information until finally he read verbatim from the screen,

“‘Original codebase Minecraft 2009 Notch Persson.’ Wow, that is old. And if I remember correctly we had to beg the college librarian to release the code to us just to let us play it. She wasn’t happy though. It was of her prized items. Odd to think that code from an old game is still somewhere in there.”

Ant and Ben worked on through the afternoon. Ben’s partner and daughter returned home together and he was distracted by their various stories of both of their meetups. Ben suggested that Ant might like to stay for dinner but the prospect of a late night robo-bus trip encouraged Ant to decline.

On his bus journey home Ant reflected on his day. He took a quick scan of the bus to see if his travel companions of the morning were on the bus too. But, of course, the chances were very unlikely and they were nowhere to be seen.

At home, Ant flicked on the printer. He couldn’t remember what meal he had scheduled for today but he didn’t mind. He left the printer to get on with his meal. He was feeling the combined effects of a day’s work at a new job and the excitement of his tangible progress towards student level 7 with only a few hours of effort. Ant quickly scanned the day’s vinecasts and blogs (failing to spot the photograph of the couple from the morning’s bus ride that was appearing in one the day’s city blogposts). His

meal finished being printed and he ate quickly. His rapid pace - such a shift from his normally relaxed evening's activities - was purposeful. Fifteen minutes later the login screen for Logistics World reappeared on Ant's tablet. Ant did occasionally work after hours as a freelancer but tonight he had a different purpose. He quickly logged in and was soon scanning the docs. His target was specifically the description of genecoins and the different meanings associated with the individual miners and item types.

In the entry for "Genecoins, Types and Meaning of" it said, "...genecoins' colours and sizes are determined by a variety of factors including the importance of maintaining security for individual genecoins as well as the anonymity of the donor. The constant factor for all genecoins of all ages is their size which is automatically created by the miners as an assessment of their initial worth. This assessment of worth is also connected to the colour of the genecoin which the miners use, in part, as an indicator of what they consider as the best potential application for the genecoin itself. Unfortunately each miner guild uses slightly different colours for this assessment and it is generally considered good practice not to consider the colour and size of genecoins for everyday use. To make matters more complex older genecoins will develop a patina over time that provides an indication of their age, their previous usage and relative rarity. Genecoins that persist after the lifespan of their donor will also develop a ridged edge as a mark of respect and as a further indicator of their rarity..."

This was what Ant had wanted to find but the description was also a surprise. His previous experience of accounting had never made any mention of any differences between individual genecoin. The perspective in accounting was that a genecoin was a genecoin unreservedly and completely interchangeable. This principle of universal exchangeability was at the heart of any currency. Wasn't it? Ant found himself considering this founding principle carefully.

Ant scrolled past details of the technical specifications and the challenges that these specifications represented to logistics. He felt slightly guilty for overlooking the very details that related to his new job but that, he reasoned, was why documentation was always available. They will always be there for the one day in the indeterminate future when you need to extract the exact details to solve a problem that you have not yet imagined. The documentation then highlighted a further complexity in the economy of genecoins.

"...it is possible that genecoins will reach the end of their usable lifespan. This is a rare event and will potentially occur only a few times during any one person's involvement in *Logistics World*. A deceased genecoin will become completely black and cease spinning within the *Logistics World* interface. When this occurs the only option available for handling the genecoin is for a minimum of three partners level 10 or higher all with gold security badges to collectively move the genecoin to a black genebin which are themselves relatively rare within *Logistics World*. As a consequence the disposal of deceased genecoins is well-rewarded and competing guilds will often attempt to hijack missions that set out to dispose of them. In periods when the availability of supply cubes is low in some regions guild leaders will instruct lower level guild members to guard known black genebins with the express purpose of preventing competing guild from using the genebin for disposal..."

Ant looked up. He knew it was a silly response but he could feel himself becoming tense. Nobody had told him that there was any adventure in logistics or that genecoins were so complex. Looking back at the tablet and a quick click closed down the documentation to return to the main interface. In one of those strange twists of fate that seem to happen so often, a genecoin had appeared in the interface on Ant's tablet. From his earlier reading it was immediately obvious to Ant that this was quite an old genecoin. Ant watched the genecoin slowly spin for many minutes almost mesmerised by the colour he saw but at the same time he knew he could not move or interact with it.

Very slowly, almost imperceptibly, the old genecoin became smaller. When he realised what had happened Ant almost dropped his tablet. If he had not been watching the genecoin so intently he probably would have not even noticed. He quickly sent a Tx to Ben,

"Do genecoins ever shrink?" The reply came back almost immediately,
"?? No. I think that would be like stealing."

2.1. *Applying the Sci-Fi narrative*

"The New Day", is intentionally incomplete in terms of the explanations it offers and instead provides contextualising and scene setting for the imagination and the workshop.

The expectation is that participants will almost unconsciously 'fill in the gaps' and in this thinking be able to make a contribution in the workshop. The focus of attention from each individual participant will vary and contribute to the richness of the experience. Understanding the overall direction, purpose and audience of the workshop through the sliding scales proposed in Figure 2 will assist a facilitator in maintaining a focus while not stifling the creativity of the contributions.

Of particular importance to the workshop and the use of narrative as a device for discussion and development is the way in which science fiction enables a breaking away from accepted practice and encourages a criticality that always evident in professional workshops or educational delivery. Levi-Strauss (1969, 19) is again instructive when he suggests that, "We act and think according to habit, and the extraordinary resistance offered to even minimal departures from custom is due more to inertia than to any conscious desire to maintain usages which have a clear function."

3. **Conclusion**

As discussed previously Science Fiction Prototyping practice has largely focused around delivery within classroom style workshops or as role-playing activities, however the workshop proposed here is an expansion event. The workshop focus presented in this paper attempts to move the vision of the prototype to its potential strategic and operational form (shown in Figure 1). As an expansion event, the workshop, therefore encourages participants to read or listen to the story prior to the workshop and bring their thoughts, opinions and critiques (hopefully of the future world rather than the literary style employed by the story). This is in conscious distinction to the tendency within current SFP practice to silently merge the two

distinct 'parts' of a prototype; the first, the creative creation and the second to offer the prototype for interpretation. The expansion element of the workshop is possible with the adoption of a critical perspective. The participants are encouraged to consider a number of questions for example that may include; Is this future a desirable one? Are aspects of the future described desirable, while other aspects preferably avoided? Is a separation of the positives and negatives realistically possible? What are the social, economic and technical implications for this future? Are there new technologies that could be explored that are drawn from the story? Ultimately, there are two overarching questions. Do 'we' want this future? If 'we' do how do we get there? If 'we don't how do we avoid this conclusion? These questions are themselves precursors to a far wider set of questions including, "How could a business or a council plan to achieve the desirable aspects of the story?"

The many questions posed by the story within the workshop contributes to the authorship of the prototype and as a creative activity can either inform an entire workshop or be expanded to include a series of workshops. Activities presented within the Science Fiction Prototype workshop will stimulate a particular desired output (for the business educator). In a series of rolling workshop events the output and creative authorship then serve as the basis of the input for subsequent workshops with entirely different audiences. A partial parallel to Papanek's (1997: 307) "omni-directional net of several design 'events'" and Wu's (2013) 'cyclic SFP'.

In contrast to Papanek (1997) and Wu (2013), however, we identify an additional purpose for generally iterative educational approaches. By constructing the SFP workshop as an expansion event we argue that alternative questions can also be asked; "How can a business plan to avoid the less desirable results described in the story?" This reverse question can be equally and validly posed as a form of critique and challenge accepts practice. This is a form of question that is very often left unconsidered in conventional business planning which results in a business succumbing to the fallacy of success (Chesterton 1915). With all of these questions there should be no expectation for consensus but rather different streams of discussion that diverge, speculate and expand on the original narrative. Potentially creating new prototypes of the future that can be, in turn, receive the same levels of scrutiny.

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