



Sustainable Innovation Management in the Food Industry

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The dominant innovation strategy of large food companies has long-time revolved around the repeated application of a successful, yet costly scheme that does not lend itself well to walking off known business roads and product/service models.

The revolutionary paradigm of 'Open Innovation' (OI) that has crept into the food industry with the aim of increasing and diversifying the company inflow and outflow of innovation-related information, together with the birth of start-up companies with extremely innovative profiles that has followed major societal changes and the increasing awareness of consumers have led to the opening of new innovation scenarios in the food segment and beyond.

This paper describes the case of how the Swedish and World-leader crispbread manufacturer Wasa, a major company in the constellation of the Barilla Italian multinational Company, tackled the brand challenge of increasing its penetration beyond the "core Countries" markets through open innovation and the mutual nurturing with a start-up company. The paper summarizes some key elements of a recently started and actively ongoing initiative and discusses some of the lessons learned, which can be further explored in future research, practice, and policy.

1. Introduction

For decades, the global innovation leadership has been held by big food companies whose dominant strategy has been centered around building well known and trusted brands, a mass market-sustainable economy through scale, consumer testing and the repeated application of this successful (and hoped-for, forever-lasting) model. Although this business model has proved to be robust, it is costly and does not lend itself well to walking off known business roads and product/service models.

In the last 10-15 years, an increasingly complex scenario (including the "World of anger", the awareness of the global warming threat, and the uprise of scandals involving the food industry among others) combined with the raising awareness of consumers, has led to the birth and growth of several start-ups. Start-ups are young companies founded by one or more entrepreneurs to develop a unique product or service and bring it to the market (Investopedia, 2020), typically funded, at birth, by the founders and/or their friends/families. Start-up companies look for investors to develop their business and, while venture capital, business angels, crowdfunding, and administrative regulations generally facilitate the process of creating such a new company, the process is not equally smooth in all Countries.

Successful start-up founders can frequently identify an idea that creates a connection with consumers by also making appeal to their values. An example can be found in those start-ups developing meat alternatives 'to save meat and Earth' and 'save the best planet in the known universe' (Impossiblefoods, 2020) that connects in a very iconic way to the overall idea of sustainability. Sometimes, food consumption is also affected by ideology,

as is happening in Hong Kong, where consumers avoid 'suspected pro-China' restaurants through an app (ABC, 2019).

While big companies can rely on a standardised approach to innovation involving consumer testing, a fairly long development time (covered by a proportioned budget) and an overall process carried out inside the development cradle of an established brand, start-up companies have little or no revenue coming in and thus need to develop, test, market (and possibly succeed) their idea fast. On the pro's side, start-ups are often able to innovate in ways, and at rates, that established companies are simply unable to even come close to, and it has even been argued that achieving sustainable competitive advantage is no longer feasible in many fast-moving industries (Mc Grath, 2013).

The rate of birth of start-ups has acted as a strong driving force for pushing the boundaries of innovation in the food segment and beyond. Indeed, apparently, the combination between the energy and focus of start-ups with the resources and scale of a large company seems an ideal match (Chambers, 2018), although many pitfalls behind the scene hinder this kind of collaborations.

Keeping the innovation pace by working with start-ups, requires Corporations to be able to screen, identify, work with, and monitor larger numbers of start-ups than before, develop an attractive value proposition toward them, and match the start-up engagement model to the company's goals. Traditionally, large companies have engaged with start-up companies aiming at maintaining a certain degree of control over them, by corporate venture capital, or by inside-out incubators that launch new ventures or spin-offs. However, these methods of engagement have shown scalability limits; thus, an upper cap exists to the achievable innovation speed-up advantages. In order to gain a real innovation edge, therefore, more scalable start-up engagement models should be adopted, e.g. by adopting an outside-in program, which identifies existing start-ups' technology and evaluates their usefulness for the large Corporation. In this case, the process starts with a Call for proposals in various problem areas. Potentially interesting start-ups who respond to the call get the chance to pitch their idea and act as suppliers of the corporate. Otherwise, an inside-out model can be adopted, which lets start-ups build their products using corporation-supplied technology to expand the market for the corporation (Chesbrough, 2019).

These challenging times are forcing established companies to develop a new sustainable approach to innovation, pushing their boundaries and learning from such lean and agile organizations as the start-ups, which are able to 'talk to consumers' and innovate in different ways. Nevertheless, start-ups success rate remains low (Forbes, 2015), and big companies (Unilever, 2020; P&G Ventures, 2020) are developing venture capital organizations to actively seek out promising start-ups to bankroll in return for a stake in the company once it gets off the ground.

This paper describes the case of how the Swedish and World-leader crispbread manufacturer Wasa, a major brand in the constellation of the Italian multinational Company Barilla, tackled the brand challenge of increasing its penetration beyond the "core Countries" markets through open innovation and the mutual nurturing with a start-up company, resorting to a lightweight model broadly following the outside-in model. The paper outlines some key elements of a recently started and actively ongoing collaboration initiative between a start-up (Plant Jammer) and Wasa under the corporate-level hood of Blu1877. The presented innovation initiative is based on the basic outside-in model, beefed-up with inside-out information flow. This article discusses the adopted methods of a hybrid method, whose results will provide insight and guidance for future research, practice, and policy.

2. Blu1877, Barilla's start-ups coaching cradle

Blu1877 is an innovation cradle whose mission is supporting innovators in developing new food ecosystems that respect people and the planet so as to create the future of 'joyful' and sustainable food (Blu1877, 2020). Blu1877 operates along an outside-in lightweight model through so-called "Calls". Once strategic or relevant topics have been identified, a global call for start-ups is launched through the Company's website.

In the case study that is analysed in this paper, the call was related to so-called 'Channels'. Specifically, the call was asking to offer solutions on how to increase access to consumers outside of traditional retail and investigating what alternative channels could be the new normal demand.

This program was called "Good Food Makers" (GFM). After the program was launched, start-ups could apply for a period of 2 months. Then, a selection phase has gone on for about 6 weeks and, finally, the program can be developed for 8 weeks with the selected start-up. This represents an alternative path to increasing brand penetration through innovation.

Through GFM, the selected start-up can leverage Barilla's technical expertise and extensive network: they can test, prototype, and collaborate with Barilla's team of experts without any cost or equity to participate.

Solutions that were scouted included:

- İ E-commerce grocery delivery

- ï E-foodservice meal kit delivery
- ï Holistic, lifestyle start-ups and platforms
- ï Sustainability-focused platforms and services
- ï Health and wellness brands
- ï Innovative retail locations or displays

Rather than deploying the development, testing and launching of new products, the company opted for a stronger engagement of their customers by resorting to a creative collaborative deployment of an external technology in the hands and skill of a start-up company.

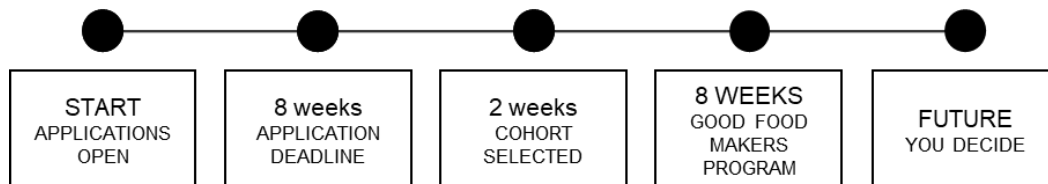


Figure 1: Sample program timeline describing the working and timing of the Blu1877 fund start-up up selection and coaching.

3. Start-up coaching and synergy

3.1 Plant Jammer, the selected start-up company

The selected start-up was Plant Jammer, a Danish start-up established in 2016 (Plant Jammer, 2016). The start-up main product is an AI-powered ‘cooking assistant’, which allows users to build personalised recipes, starting with what they have in their pantries or refrigerators or on sale in the local/closer supermarket.

This concept is known as “dynamic recipes” and allows consumers to build their recipes bottom-up rather than top-down.

Particularly, the engine behind Plant Jammer (hereinafter, PJ) is an ‘artificial intelligence chef’ that can quickly, and easily, build recipes that fit your available ingredients. This has been done combining three different technologies:

1. a neural network that has been trained on 3 million recipes, resulting in an ‘Internet of food’: each recipe constitutes an element teaching the AI that a set of ingredients can go together;
2. a ‘human intelligence’ touch: an algorithm has been developed by talking to professional chefs and tagging each ingredient with the core components of good flavour (salt, umami, sour, oil, crunch, soft, sweet, bitter, spicy, fresh, and aroma). PJ’s algorithm proposes something from each of these components, so that each ingredient plays a role.
3. a modular approach to recipes: the algorithm can build a recipe from any set of ingredients. They can build stir fries, soups, pizzas, pastas, salads, tacos, porridges, risottos, quiches, stews, casseroles, green meat, dips, and much more.

3.2 Wasa, a leader brand seeking for innovation

4. Established in Sweden in 1919, Wasa is the world’s largest producer of crispbread and part of the Barilla Group Since 1999. Thanks to its high quality and the variety of its product line, the brand gratifies consumers in more than 40 countries from Scandinavia to America. In the United States, Wasa is considered to be a premium product. The Company believes that a good awareness campaign could improve the penetration of their products among young resourceful families. Wasa is also confident that the same concept can be applied both to other consumer segments and to other geographic areas afterwards. Therefore, a specific project was set up around this objective.

3.3 Customer engagement by lightweight synergism between corporate and start-up

Wasa proposed to create ‘recipe experiences’ on plantjammer.com that targeted the primary and secondary goal above. By dynamically integrating Wasa recipes into plantjammer.com, Wasa created a fast and iterative approach that could potentially be applied to Wasa’s own website pages. The hypothesis for a campaign motto was: “Make the breakfast table into ‘Allemansrätten’”. By paraphrasing the usual legal meaning of ‘Allemansrätten’ (the Nordic right warranted to every man to freely roam and access certain public and private areas), here, Wasa is aiming at ‘warranting everybody right to wander through the breakfast table’; this would

be obtained by empowering the head of the household, with or without their children, to create spreads, mains, and toppings for Wasa bread—that will then be placed on the morning table as 'Allemansrätten' to combine and experiment in the morning.

The procedure that Wasa is going to apply consists on the creation of 20 to 50 dynamic recipes based on the Wasa product line.

The advantages of this solution are manifold:

1. Community building. Visitors can interact with the recipes – e.g., a recipe can be made child-friendly, protein rich, or vegan. This creates recipes that people share more and engage with frequently, building the Company's brand, and reminding the Company's customers about the Company's products.
2. Strong branding. Focusing on fiber-rich breakfast has potential as a nutritional platform to position Wasa as a global ambassador of Nordic diet.
3. Alternative channels. Wasa products are incorporated into the dynamic recipes and generated additional sales and awareness through a new channel for Wasa bread.

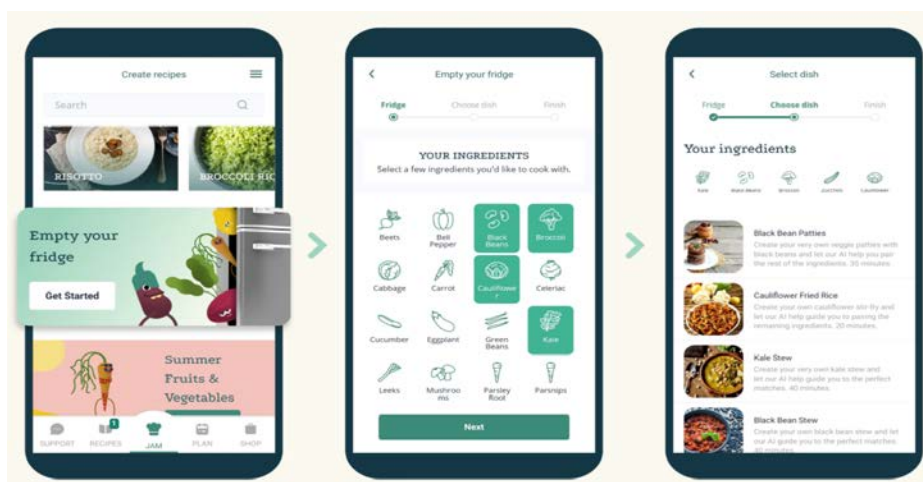


Figure 1: Consumer's preference-centred Dynamic Recipes by the Plant Jammer AI-based approach

From a company-centric point of view of the marketing initiative, Wasa objectives revolved around the general aim at engaging healthy snack consumers in an online environment with recipe content, further listing the exploration of user-editable recipes, and the measure of the impact of channelling web recipes in different web site environments. PJ, on the other side, aimed at measuring the power of its AI-based technology on an external test case, as well as making consumer value by better understanding consumer interaction with its technology.

Objective of the marketing initiative is engaging healthy snack consumers in an online environment with recipe content. In digital marketing, using an "A/B" test means that two versions of something (eg, a digital interface) with only a few minor changes (the test variable) are comparatively assessed. In the present case, where PJ is making its Artificial Intelligence (AI)-based interface to Wasa, this latter will run online ads to 100 people, and 50 will be directed into experience A (the PJ website) and 50 into experience B (the Wasa website).

3.4 Marketing analysis design

The "Key Question" in the relation between PJ and Wasa was whether interactive recipes, powered by PJ AI engine, can increase the Wasa customer engagement toward Wasa recipe content.

The test has been designed to be an A/B online test, in which Group A is directed to the new recipe website at recipe.plantjammer.com/wasa, which includes interactive recipe content provided by PJ AI (PJ-redirects), while group B is directed to the existing recipe website at wasa-usa.com/recipe, which only features static recipe content (Wasa-redirects). Wasa then compares what happens in the two groups, which website pages are navigated, how long do visitors stay, what actions they take on the page, etc. A very important trait of this methodological approach is that it is scalable and lets the marketing and ICT department iron out problems before deploying it at the final intended scale.

Consumers will be targeted online in the Boston, Miami, NYC metropolitan areas via ads on Google, Pinterest, and Reddit. After viewing identical ads, online users will be randomly assigned to either group A or B.

The test was analysed by using web analytics. Key Performance Indices include: the "click-through rate" (that should be identical between A/B, but was checked to ensure a fair comparison), the "Bounce rate", the "Session

Duration”, the “Number of pages visited”, the “Number of return visits”, the “Number of recipes saved”, and the “Number of recipes shared”.

4. Results and discussion

The quantitative results of the specific stage of the experiment carried out in the frame of this OI relationship revolve around the A/B test resulting in click-through rates that were indeed very similar between the two opposite routings, but in general rather low (~1%), and around the “binary” character of user sessions, with many website explorers bouncing after the first page and just a few spending more time on the ideas proposed by the site, in any case mostly showing an “exploratory” behaviour. Bounces appear to be 4 times more frequent for the PJ-redirects than for the Wasa-redirects, though. Furthermore, a qualitative result of the investigation was that the time available to turn a casual visitor into a causal one is half a second, a blink of an eye that deserves that the large remaining part of the total budget of the coaching initiative be invested in further developing the project.

It is also clear that the limitless 'novelty by design' that start-up companies can bring with them at birth marks a significant difference with the traditional approach by which typical large companies have renewed themselves. This latter is indeed costly, slow, and self-referential, and is therefore 'limited by design'. So limited and slow, as to seem quasi-static in a fast-moving world, to the point that it has even been argued that achieving sustainable competitive advantage is no longer feasible in many fast-moving industries (Mc Grath, 2013). It is very true that the European food market is much more traditional-oriented than others, so that so far it has resisted to the expansion of many otherwise disruptive technology with much potential (e.g. the definite popular contrast to Genetically Modified feedstocks, or the pale reaction to novel sustainable feedstocks, such as insect-sourced protein, Euraktiv, 2020) and is very cautious in evolving the concept of food or anything that may come in contact with it ('Novel Food' regulation, safety and health claims clearance).

In this international scenario, Barilla plays as a world-class enterprise while still having its roots in Italy, a Country whose food market is particularly conservative on the crystalline base of a national “healthy food model” that the wide variety of available traditional specialties supports. However, it can also be observed that the equally healthy condition of the Italian food industry owes much to the export and that the innovation capability of the Italian food enterprises contributes to this health significantly (Bravi, 2020). Considering that the role of cost-reduction in ensuring edge competitiveness to the entire corporate is well described by the Value Added per Unit Workforce, and that Italian big enterprises, collectively, lag behind medium-sized companies (108 K€ vs 1.1 million € by elaboration based upon Bravi, 2020), Barilla teaches and important lesson for the big companies to learn in times of disruption as the present one as to how to change the usual rules of innovation to maintain both a flagship technology and financial edge.

Indeed, there are multiple ways to address innovation, and it has been observed that incumbents, or big seasoned players, fall into three categories where the first fails to recognise the risk and falls into the classic 'Christensen trap' (Christensen, 2013) ignoring the potential change. The second understands the disruption but spend exaggerate resources in tackling the challenge; again, they fail to address the goal. The third (and most considerate) group approaches innovation renovation by embracing the Lean Thinking philosophy, to benefit from both from new view ranges and from a reduced budget footprint. 'Leaner by design' entails dropping overhead to both cut cost and uncapped novelty generation (McGrath, 2020). Even in this lean approach, while traditional models that ensure full control of the whole process and IP such as Corporate Venture Capital (CVC) and inside-out incubators may tease the top management, they do not fully unleash the disruptive potential of novelty, nor do they scale to the needed extent for ensuring innovation and growth at a large scale (Chesbrough, 2019). Barilla option toward start-ups, which has a parallel in other large corporations operating in the food industry (such as Unilever: Unilever, 2020) has been implemented in a hybrid mode in the sense that the start-up company is selected through a public call aimed at a Company's challenge (here, increasing market penetration by actively 'engaging' customers), and thereafter helped to create such value and a long-term benefit for both enterprises, whose benefits for the whole corporate are being measured on the major test case of Wasa, an essential tile of the corporate mosaic.

For the time being (this is an ongoing experiment), Barilla's value and benefits revolve around the possible ways Wasa might turn the exploratory attitude into an engaging discovery attitude, e.g., by first fascinating first time visitors by conveying brand's key values in an attractive manner (e.g., by a video), then channelling them through to the intended context and making it as wide as possible (e.g., go straight to the recipe page, and provide an environment of similar recipes), and providing an opportunity for further focussing the engaging experience (e.g., search filtering). A further point of improvement relates to the creation of links: forward links from the site to the customer. (e.g. by the " save and send" procedure) and backward links that enable tracking of returning exploratory visitors (e.g. , in order to maximise the chance to transform a bounce into a causal visit), and projecting the recipe content onto different websites by transforming current content into so-called 'Omnichannel

Recipes'. Large part of the total budget allotted to the 'case', which is a small fraction of the cost of classical marketing inquiry operations with a similar ultimate scope is still intact for the remaining investigation steps; timewise, similar considerations can be drawn.

A key aspect of the innovation is to be able to be "glocal" (global and local), in other words able to embed both global and local aspects as reflected here in the attempt to "localize" for the US market products with Swedish roots without losing the product and brand main characters and present themselves as a consistent choice for consumers. Barilla/Wasa have been pursuing for years the challenging mission of a sustainable business, balancing profit with social responsibility through several initiatives (Barilla Center for Food and Nutrition: Barilla, 2020; Wasa CO₂ compensation program: Wasa, 2020). The choice of PJ was again centered on the delicate task of balancing the three main pillars of business (market penetration), health (development of healthy recipes) and sustainability (the intriguing concept of dynamic recipes based also on potential leftovers, thus reducing the environmental impact linked to food waste).

5. Conclusion

While at the time of this writing the full story that is being reported has not been written, some important take-outs are that innovation must be able to be global and local, and that co-existence plays nicely with the mutual exchange of benefits between the corporate and the start-up company. Beyond the actual technology which is being deployed thanks to OI agreement, both benefit from a trade-off of respective strong points. While this is clearly not the rule for every innovation step taken throughout the life of a large and complex enterprise, it marks a definite step toward lean open innovation and shows the way large companies can preserve their role in large scale and large scope food production worldwide, and also provides a nice example to other major Italian companies on how to safeguard competitiveness in the challenging decade following the pandemic.

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