

CROSS INDUSTRY INNOVATION

System transformations
Future markets
Strategic alliances

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The central innovation themes of the next few decades cross the boundaries of the traditional sectors. Cross-sector innovation is becoming the strategic imperative: the creative combination of complementary competences is the invitation to play a leading role on the innovation stage of the future.

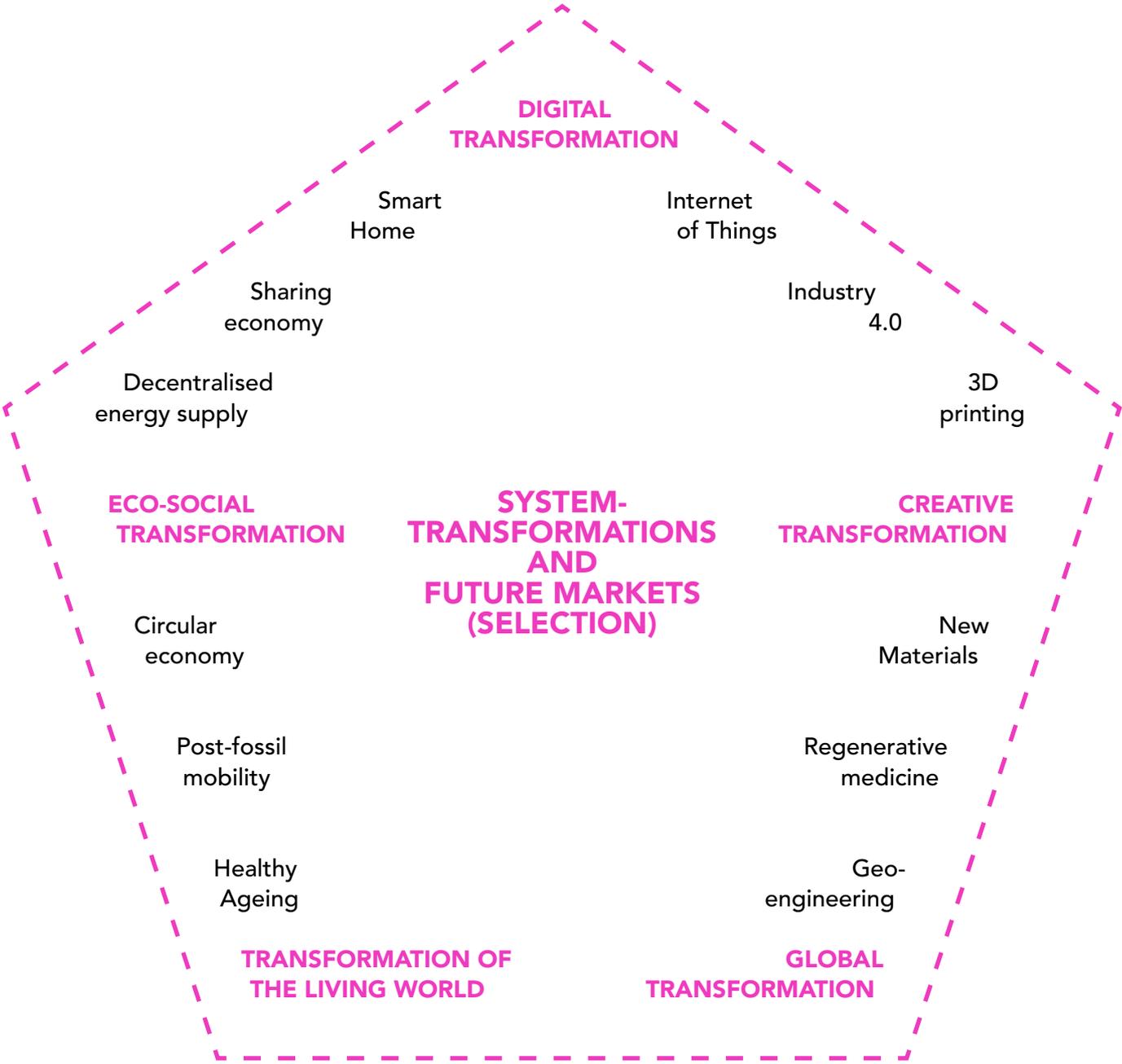
1. Future markets arise out of system transformations

Markets are places where requirements are fulfilled through the interplay of supply and demand. Financial, social, political and technological realities determine which products and services are most traded in the market. Whenever there is a significant change in these realities we talk about a system transformation. System transformations generate future markets.

Five system transformations shape the markets of tomorrow:

1. **Digital transformation** gives rise to a social reality in which all aspects of life are networked through information technology and where artificial intelligence plays an increasingly important role.
2. **Eco-social transformation** describes the transition to an economic model that combines the profit motive with social and ecological aspects, promotes an intelligent relationship with natural resources and strives to enable as many people as possible to benefit from social and economic development.
3. **Creative transformation** indicates the seismic shift brought about by progress in the life sciences and engineering, which puts people increasingly in a position to interfere creatively with nature at the level of both the tiniest particles and the largest systems, from nanotechnology via growing human organs in the lab to climate engineering.
4. **Transformation of the living world** takes us into a society marked by asymmetrical population dynamics and social inequality, one in which a fresh impetus towards individualization transforms daily lives and changes our relations with others and our patterns of consumption and of work.
5. **Global transformation** covers the far-reaching cultural, political and economic processes of change at a global level, which express themselves in increasingly complex conflict situations, in a struggle related to cultural values, geo-strategic spheres of influence and access to markets.

System transformations offer a unifying perspective of the often confusing multiplicity of trends and forecasts discussed in the media and specialist literature. They also offer an overview of the markets of tomorrow. (See Figure)



2. The markets of tomorrow straddle the boundaries of today

System transformations work on the principle of creative destruction, question the old and give rise to the new. The future markets generated by system transformations straddle the boundaries of today. Three examples: the transition to post-fossil-fuel transport lies at the interface of the motor-vehicle industry and the energy industry; in the wearables and smart textiles market of the future the clothing industry and ICT will come closer together; and in personalized medicine the boundaries of pharmaceuticals, diagnostics and medical technology will be blurred.

Start-ups will react to the cross-sector aspect of core future markets by straddling the traditional sectors from the outset. Airbnb and Uber are young companies that will open up new fields of business in the sharing economy, a key market of the future. Both are difficult to place in the traditional sector model. Airbnb is not purely an Internet company but competes with hotels for guests. However, as a platform for offering peer-to-peer accommodation to travellers Airbnb is certainly not part of the hotel sector either. Similarly with Uber: not a supplier operating through the Internet sector in the narrower sense, it isn't a taxi firm but competes with them. The fact that the competence profile of such start-ups straddles the boundaries of the established suppliers makes them unpredictable as competitors and is a basic reason why disruptive innovations so frequently begin as start-ups.

Established companies find themselves in a quandary. They have very close ties with their sector and their customers and for the time being have an interest in not breaking the mould. Nevertheless they must open themselves up to the potential of future markets. Those who stick to the old sector boundaries risk being left behind. Top-management has recognized that and, according to a survey carried out world-wide, managers see the new definition of sector boundaries as the most important structural change for companies in the next five years.¹

The study Germany 2030. Outlook for Creating Value, published jointly by Z_punkt and the BDI (Bundesverband der Deutschen Industrie – Confederation of German Industry), thoroughly examines a possible solution that is as obvious as it is potent: "Cross-sector cooperation management is becoming the critical factor for success in innovation systems geared towards creating value."² In short, cross-industry innovation.

1 Accenture (publisher): Remaking Customer Markets. Unlocking Growth with Digital, 2014

2 BDI/Z_punkt The Foresight Company (publisher): Germany 2030. Outlook for Creating Value, 2011

3. The strategic imperative: Cross- sector cooperation

By cross-industry innovation, innovation research understands innovation that arises from the creative combination of know-how from various sectors in the form of an innovation partnership. It may involve a new product, a new service or even a new business model.³

The research differentiates three directions of impact for cross-industry innovation processes: outside-in, inside-out and coupled.⁴

Outside-in cross-industry innovation means adapting solutions available in another sector for one's own sector. Thus BMW used the TouchSense technology invented by the Californian company Immersion to develop the control concept for its iDrive driver-assistance system. Previously TouchSense technology had mainly been used in joysticks. In TouchSense BMW found a solution from another sector that could be used in the motor-vehicle industry.

On the other hand, companies are looking outside their own sector for applications for their own solutions, which is known as inside-out cross-industry innovation. For example, for a long time Gore-Tex membranes haven't been used only in clothing but also in other sectors, such as in medical implants. Gore-Tex thus markets its own solutions beyond sector boundaries.

3 Cf. Oliver Gassmann et al.: Crossing the Industry Line. Breakthrough Innovation through Cross-Industry Alliances with Non-Suppliers. *Long-Range Planning* 43, 2010, p. 639-654; Sabine Brunswicker and Ulrich Hutschek: Crossing Horizons. Leveraging Cross-Industry Innovation Search in the Front End of the Innovation Process. *International Journal of Management* 14:4, 2010, p. 683-702

4 In general, the three processes are relevant for open-innovation processes, therefore always when companies open their innovation activities to the outside. Cf. Ellen Enkel, Oliver Gassmann and Henry Chesbrough: Open R&D and Open Innovation. Exploring the Phenomenon. *R&D Management* 39:4, 2009, p. 311-316; Ellen Enkel and Oliver Gassmann: Developing new sources of ideas. The opportunities provided by open innovation. *Marketing Review St Gallen*, 2/2009, p. 6-11

The coupled process is seen as the ideal way to open up future markets. According to the well-known innovation researchers Enkel and Gassmann it includes “a process of innovation and development from the initial idea to marketing, part of which can be shared and which can also be based on the division of labour.”⁵

The coupled process is the process in which the partners cooperate the most intensively. It is not a matter of transferring solutions but of new developments at the ‚fuzzy front end‘, i.e. in the early stage of the innovation process.⁶ The partners enter into an alliance in order to open up a new field of business for all those involved. This type of strategic innovation partnership is what the authors of the Z_punkt BDI study mean when they state: “Sectors no longer stand aloof from one another but cooperate insofar as they share a common business model.”⁷

One example of cross-industry innovation in the sense of the coupled process is the cooperation between Google and Novartis, revealed in July 2014, in developing smart contact lenses, which, among other things, are claimed to be able to measure the wearer’s blood-sugar level. The partnership benefits from Google’s technical lead in the field of IT, whilst the Novartis subsidiary Alconon, which specializes in ophthalmology, contributes its medical and physiological expertise to the partnership.

This example illustrates an aspect that is central to the coupled process: knowledge flows in both directions. “Cooperation [in the coupled process] takes place in alliances, cooperation and joint projects, where give and take is of prime importance”, say Enkel and Gassmann. Where sector boundaries are blurred this pattern becomes the rule: the creative combination of complementary competences is the invitation to play a leading role in the innovation arenas of the future. Cross-sector cooperation is becoming the strategic imperative.

5 Enkel and Gassmann, op. cit.

6 Cf. Oliver Gassmann and Fiona Schweitzer (publisher):
Management of the Fuzzy Front End of Innovation, Springer 2014

7 BDI/Z_punkt, op. cit.

4. Partnerships for future markets: Best Practice

The fact that innovative companies are more profitable and grow faster is shown by a large number of studies.⁸ Innovation in a cooperative framework plays an increasingly important role in this. According to a broad study carried out by PricewaterhouseCoopers a crucial feature of the most innovative companies worldwide is that their creative abilities are based on cooperation.⁹ The most important levers for company growth, say 500 senior managers surveyed by Accenture, are strategic alliances.¹⁰ A study carried out by the DLR (Deutsches Zentrum für Luft- und Raumfahrt – German Aerospace Centre) substantiates the connexion, especially in the case of SMEs: “Every commitment to cooperate leads to an increase in successful innovation, and usually a very clear-cut one.”¹¹

The need to use strategic alliances to cross sector boundaries in order to open up important future markets is also recognized. Developing the various use cases of Industry 4.0 – such as networked production, adaptive logistics and customer-integrated engineering – requires partnerships, since, according to the Industry 4.0 working group, “most revolutionary applications are expected to arise out of cooperation in the fields of ICT and production and automation technologies.”¹² Establishing networked services also requires cross-sector cooperation, for instance in the field of smart health, where an Acatech study predicts cooperative business models “as well as the current operators in the field of health care”.¹³ According to a current market survey the same applies in the case of personalized medicine: “In the near future new products and services in the field of personalized medicine can be developed only through networking and cooperation.”¹⁴

This overview makes it clear that cross-industry innovation is not important for individual sectors alone. There is already a large number of company partnerships. (See examples on the next page.)

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- 8 Cf. Oliver Gassmann and Philipp Sutter: Practical Expertise Innovation Management. From the idea to success in the market, Hanser 2013
 - 9 PricewaterhouseCoopers (publisher): Breakthrough Innovation and Growth, 2013
 - 10 Accenture, op. cit.
 - 11 Deutsches Zentrum für Luft- und Raumfahrt (publisher): Innovation Driver Cooperation. Opportunities for SMEs, 2013
 - 12 Forschungsunion/Acatech (publisher): Implementation Recommendations for the Future Project Industry 4.0, 2013
 - 13 Smart Service Welt working group/Acatech (publisher): Smart-Service Welt. Implementation Recommendations for the Future Project Internet-Based Services for Businesses, 2014
 - 14 Elisabeth Eppinger et al: Market Survey of Personalized Medicine. Overview of Key Operators, Drivers, Potentials and Barriers for Companies, 2012

Partnerships for future markets (examples)

Smart textiles and wearables:

- > Rimowa, Airbus and T-Systems are working together to develop an intelligent suitcase
- > Google is cooperating with Novartis in developing intelligent contact lenses
- > Nike is cooperating with Apple, Adidas with Google

Industry 4.0:

- > AT&T, Cisco, GE, IBM and Intel make up the Industrial Internet Consortium
- > the agricultural-machinery manufacturer CLAAS is cooperating with T-Systems to develop remote-control solutions for harvesting

Post-fossil-fuel transport:

- > RWE is cooperating with Schneider Electric in developing charging infrastructure for electric vehicles
- > ABB is working with Volvo to develop fast-charge systems for electric buses

Autonomous driving:

- > Continental is cooperating with Google and IBM to develop back-end technology for communication between autonomous vehicles

Energy efficiency:

- > Airbnb is working with the thermostat manufacturer Nest to equip more homes with intelligent thermostats

Sustainable manufacturing:

- > BASF, Linde and ThyssenKrupp are working jointly on a new method of producing synthesis gas from CO₂ for use in the manufacture of iron and steel

Pharmaceutical nutrition:

- > Nestlé wants to blur the borders between the markets for food and pharmaceuticals and is carrying out food research with, among others, the supplier Cellular Dynamics International

5. On the lookout for new areas of growth: Managing the Fuzzy Front End of Cross- Industry Innovation

Anyone who wants to conquer future markets must possess the strategic core skill of developing and marketing innovations as part of cross-innovation-alliances. Cross-sector innovation places special demands on the companies involved, since there is an overlap between two processes – the innovation process and cooperation management – that even individually are demanding enough.

In most large companies today innovative ideas are translated into marketable products via a strictly defined process that has precise milestones. The question is, where do the ideas come from? How is the innovation pipeline filled at the ‚fuzzy front end‘? And, in the case of cross-industry innovation, who will be the partners with whom the ideas will be translated into action?

Even today, the identification of cross-sector areas of innovation and the search for innovation partners from other sectors are in many cases purely random. In addition, many cross-sector innovations are purely technology-driven.

What is lacking is a method that allows systematic access to the ‚fuzzy front end of cross-industry innovation‘, i.e. enabling

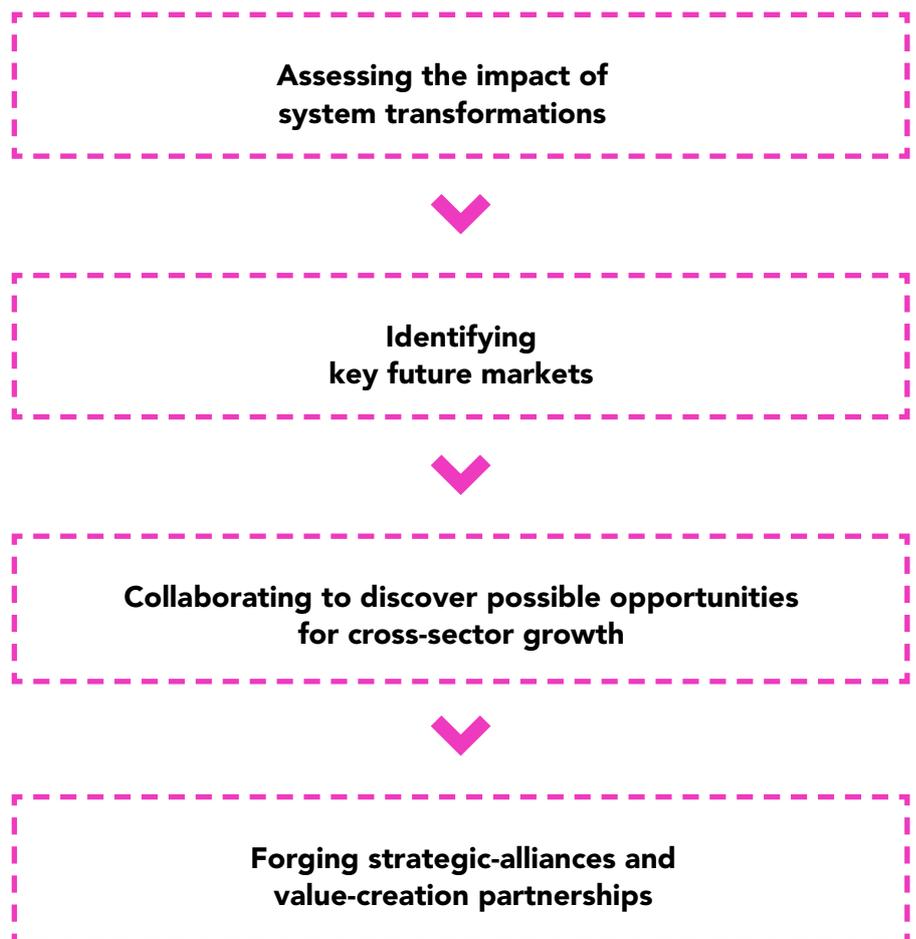
- > options for creating value and strategic partners to be systematically identified and
- > not only new technologies but also changes in customers' requirements and product parameters to be anticipated.

The corporate-foresight process is a structured approach to seeking options for growth. (See Figure 2.)

The first question is what effect the system transformations mentioned at the beginning have on areas of operation relevant to clients (stage 1). This leads to the next step, which is the systematic identification of cross-sector future markets (stage 2). The first two stages usually take place in-house, i.e. before strategic partners have been identified.

The third stage covers both working out concrete options for growth and initiating strategic alliances. We are thus in the early stage of the innovation process and in the early stage of cooperation management. It is typical of cross-industry innovation that the two activities influence each other: ideas of how a specific market of the future is to be addressed influence the search for partners and, conversely, dialogue with a potential partner influences the drawing up of concrete plans for new products, services and business models.

Companies that view innovation management also as cooperation management have the great opportunity to benefit from the dynamics of the future markets generated by the system transformations. In order to take advantage of the new potentials at the interfaces of today's sectors and markets it is important to recognize at the outset how new areas for growth and strategic partners are identified at the fuzzy front end of innovation processes.



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