Un-Careers: Facilitating Emergent, Reflexive, Contingent Learning Pathways

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Introduction

Most continuing professional education for engineers assumes a delivery model where providers focus on market needs and what programs should be delivered and how to meet these needs. It is assumed that over the course of a career, engineers undertake periodic, intense educational bursts that help them to redirect their career trajectory. The classic example is the engineer who undertakes an MBA in order to move into the management career stream. Historically this conception of continuing engineering education arose in the context of relatively stable career pathways in a particular firm or industry sector.

However over the past decade or more several major shifts have been underway that have a profound impact on engineering careers and consequently on the education of current and future engineers. These shifts are: (i) changes to the nature and organization of engineering work in the context of an interdependent global economic and trading environment; (ii) new conceptions of careers and career development as being less deterministic, more contingent and even emergent and (iii) new conceptions of work and holistic lifestyles centered on work as being meaningful and self-actualizing rather than just providing status and benefits. These changes point in the direction of "portfolio careers" in which engineers (and other professionals) have many career episodes across a life-time.

These shifts require that we revisit the explicit and implicit assumptions underlying continuing professional education and career development of engineers. Traditional approaches may not be what are needed for the next generation of engineers or even those currently in mid-career.

Changing Nature of Work and Employment for Engineers

Over the past two decades there has been an enormous shift in the operating and trading conditions for major engineering organizations driven by new technologies, globalization and changing economic conditions. These externalities have fundamentally altered implicit and explicit assumptions about the nature of employment within existing industrial enterprises in traditional industries and industry sectors including automotive, aerospace, defense, construction, manufacturing, energy and resources, and consulting. Simultaneously different ways of undertaking engineering work and new patterns of employment have been emerging in start-ups and modern-day mid-sized enterprises in new industry sectors, especially in new media, computing, software and information technology.

Templar and Cawsey (1999) summarize the “old” and “new” economic orders in terms of the impact on how we think about employment and careers. This is presented in Table 1 below.
Table 1 - Contrasting Assumptions of Old and New Economic Order (Templar and Cawsey, 1999)

<table>
<thead>
<tr>
<th>Issue area</th>
<th>Old</th>
<th>New</th>
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<tbody>
<tr>
<td>Economic drivers</td>
<td>Commodities/manufacturing</td>
<td>Knowledge/technology</td>
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<td>Job contribution</td>
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<td>Individual Contract task</td>
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<td>Loyalty</td>
<td>Organization</td>
<td>Authentic skill sets</td>
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<td>Career security</td>
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<td>Career progress</td>
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<td>Rewards</td>
<td>Compensation/benefits</td>
<td>Contract fulfillment</td>
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<td>Authority basis</td>
<td>Position status</td>
<td>Expertise, track record</td>
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<td>Control systems</td>
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<td>Career counseling</td>
<td>Organized politics/T&amp;D</td>
<td>Portfolio and contract assessment</td>
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<td>Career key terminology</td>
<td>Progress, commitment</td>
<td>Alignment, flexibility, marketing</td>
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<td>Models</td>
<td>Career stages</td>
<td>The portable (“portfolio”) career</td>
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<td>Graphical representation</td>
<td>Career ladder</td>
<td>Portfolio, flexibility</td>
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<td>Future growth</td>
<td>Recruitment</td>
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<td>Effectiveness measures</td>
<td>Efficiency</td>
<td>Strategic alliances, org. matching</td>
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In essence there is a shift from an expectation of a lifelong career in a given firm or perhaps industry sector to a much more fluid state where individuals construct a career around their core expertise which grows and changes over a lifetime. Traditional notions of a steady, onwards and upward building of a career, of career stages or a career ladder within an organizational structure are turned on their head. The focus shifts to the individual professional, their knowledge, skills and track record and how they can market these over time to a variety of firms on a needs basis. In the extreme it is about career flexibility, alignment of needs and skills, marketability of the individual “contractor,” regular self-reinvention, and the creation of a portable or portfolio career.

While this analysis of the old and new patterns of employment is generic and not specific to any particular industry or group of professionals, nevertheless its seems to capture the experience of many engineers working in many industries where engineers have been traditionally employed as well as in emergent sectors where engineers are constructing portfolio careers.

To the extent that new ideas and innovation are keys to business success, then in this new economic order with more fluid employment patterns, organizations are continually seeking knowledge, expertise and ideas external to their organizational boundaries, as much as they once did internally. This includes concepts like open innovation. In this context, Dahlander and Gann (2010) observe that;

*The concept has common currency for at least four reasons. First, it reflects social and economic changes in working patterns, where professionals seek portfolio careers rather than a job-for-life with a single employer. Firms therefore need to find new ways of accessing talent that might not wish to be employed exclusively and directly. Second, globalization has expanded the extent of the market that allows for an increased division of labour. Third, improved market institutions such as intellectual property rights (IPR), venture capital (VC), and technology standards allow for organization to trade ideas. Fourth, new technologies allow for new ways to collaborate and coordinate across geographical distances.*
These new styles of work and patterns of employment for engineers mean that current and future engineers have to conceive of a career in fresh ways.

**New Conceptions of Careers and Career Development**

Human resources professionals will look at talent development in a fundamentally different way in the future. Templar and Cawsey (1999) conceive this as a shift from “position-centered” career development to “contract-centered” career development. They list the characteristics of this shift as follows.

- **Instead of dealing with the pattern of positions in the organization, career development concentrates on understanding the skill requirements needed to accomplish the contract.**
- **Instead of identifying the best individuals with long-term potentials, career development focuses on locating individuals with the precise skill sets needed for accomplishing that task or contract.**
- **Instead of developing progressive training programs such as supervisory training, second level training and management training, career development decreases the focus on training and development and shifts those resources into identifying individuals with needed skill sets. Training and development becomes the individual’s responsibility.**
- **Orientation activities change from a socialization focus, providing new long-term employees with an understanding of the organization’s culture and expectations, to a specific focus on contract and performance definition. This includes an introduction to specific individuals and policies needed for the accomplishment of the contract.**
- **Performance management and career planning activities become short-term in orientation. Instead of a system to evaluate individual performance and potential over the longer run and to promote improvement, HRM specifies output measures for the contract employees and determines what for what contracts each individual is suitable.**
- **Compensation shifts from an internal orientation to an external one. Internal pay equity determines much of an organization’s pay structure in traditional organizations. External pay comparisons become the focal point for contract employees. The type of questions that drive this new orientation are: How much must we pay for quality work for this contract? What is the likely competition for the skills that we need to hire.**

Historically the vast majority of engineers have started their career as employees of firms with the attendant dependence upon navigating the gatekeeper role of the human resources (HR) department organization within that firm. Early career development and training is often shaped by HR as much as it is by technical stewards and mentors. Thus, this fundamental shift in HR has significant implications for how young engineers prepare for work and manage their early and mid-career development.
Anecdotal reports indicate that Generation Y is looking for mentoring and support and advice in career development from their workplaces. They are also reported to be striving to achieve a better balance between “work” and the other aspects of their lives; a particular emphasis is on family friendly workplace policies. These expectations may run counter to a trend to more portfolio careers where the individual rather than the organization assume the major responsibility for early and later career formation and development.

**New Conceptions of Work and Holistic Lifestyles**

The concept of a portfolio career contains contradictions. At one extreme it can be perceived as being liberating for the individual who, freed from the constraints conventional employment, becomes an entrepreneur with more degrees of freedom in their choices around work and construction of possible futures. Conversely it can be seen as being exploitative of their talents in a highly competitive market-place where benefits are minimized and conditions of work are dictated by the economically more powerful contacting organization.

In a study of portfolio work amongst nurse and adult educators, Fenwick (2006) found that this type of flexible self-employment generated feelings of both deep satisfaction and deep anxiety and stress. She found that “portfolio careers simultaneously embed both liberating and exploitative dimensions for workers, which are at least partly related to their own conflicting desires for both contingency and stability. Further, portfolio work embeds labour that often remains unrecognized, even by the self-employed individuals assuming responsibility for it”. This study concluded that “portfolio workers need to recognize and document their unpaid but necessary labor in work design and client relations that sustains their careers; portfolio workers may need to educate clients about the nature of portfolio work; and employers who contract to portfolio workers must take more responsibility for negotiating fair contracts that are sensitive to overwork and unfair time pressures, and that anticipate and compensate contractors”.

Taking the “glass half full” perspective on portfolio careers, Cooper (2005) argues that the “future of flexible working does not have to be a doom and gloom scenario; it can prove to be a liberating experience, giving choice and control to the individual – but individuals have to arm themselves with the right skills and attitudes, and engage in a constant programme of personal development” and that “individuals in the future will have to take responsibility for their own personal development in regard to their work towards balancing work and the family, and better utilising disposable personal time”.

In that same vein, Hoffman and Casnocha (2012) propose the metaphor of the individual professional as their own start-up company and a career as something inherently emergent and contingent that can be managed to the benefit of the individual. In actuality there have probably always been individuals who have crafted careers as if they were a start-up; for example entrepreneurs and others who have progressed by continuously reinventing themselves to capture new opportunities that lay outside the conventional. What has changed is, because the prevailing social, economic, geo-political and indeed cultural boundary conditions of work, careers have changed with such rapidity and magnitude over the past decade or so, that the start-up metaphor may be on the way to becoming the norm rather than the exception.
A more radical conception work is that of “new work” envisaged by philosopher Frithjof Bergmann (2004); “work that people deeply and seriously want to do, work that gives people strength and meaning and the conviction of a truly lived life”. The objective is to create work that gives meaning as much as it provides material outcomes. Work is re-conceptualized as being about the whole person and about being rather than merely doing. Whereas the “start-up of you” proposed by Hoffman and Casnocha is individual centric within the network of the new, dynamic, global economy, “new work” is grounded in local communities and distributed production. The “new work” economy has echoes of the utopian movements of the late 19th century or the idealism of the hippies in the 1960s, but with some interesting 21st century differences. “New work” embraces many of the same new technologies as those of the start-up, entrepreneurship economy or the portfolio professionals who work in the new economy. “New work” technologies (NewWorkCulture, 2014) are seen as creating:

- Economically independent communities.
- High-tech infrastructure for community life (housing, food, water, energy).
- Co-operatively owned business ventures.
- Decentralized manufacturing techniques.
- Entrance into the world-wide markets.
- Training, education, mentoring, and support for individual and collective pursuits.
- Access to technology, resources, information, needed for modern life.
- Greater individual and collective autonomy.
- Enhanced quality of life.

The “new work” economy has the following characteristics:

- Establishes connections between projects and technology providers.
- Adapts technologies to local conditions.
- Mobilizes community leaders and participants.
- Ensures technological solutions address community needs and desires.
- Develops comprehensive programs.
- Coordinates program implementation.
- Plans and coordinates installation of technological infrastructure.
- Creates training programs in New Work principles and technology uses.
- Trains trainers.
- Develops business enterprises.
- Opens markets for new products.
- Delivers ongoing training, mentoring, and support.

So while “new work” has a fundamentally different philosophical framework to that of conventional work and career patterns in either the old or new economies, nevertheless it does have some operational characteristics that would seem to overlap. Similarly “new work” is both a radical reconceptualization of post-industrial work while also containing practical aspects that appeal to many young engineers who seek to make a difference in the work through applying their technical knowledge in smaller, meaningful-making enterprises. This is similar to the growing appeal of service learning projects for undergraduate engineers.
Un-Careers: A New Conceptual Framework

Portfolio is commonly used in the literature to describe the type of work history that more and more engineers will likely have in the future. However this terminology carries with it negative connotations around being passive or disengaged or alternatively reactive through externally imposed circumstances that lead to having a series of contract appointments. We need a new term that not only reflects the sense of choice that a professional has in developing a preferred career pathway but also acknowledges the unpredictability associated with planning a career in a rapidly changing work environment.

The term “un-career” is therefore proposed. Its etymology is the so-called “un-conference” used by the XML developer community in the late 1990s. Subsequently a number of professional groups have run “un-conferences” as a way to bring spontaneity and serendipity to gatherings. Unlike a conventional top down, planned and managed conference an un-conference is participant driven and happens more in the moment based on the needs of the participants and what emerges through their interactions.

In an analogous way the “un-career” flips on its head the whole notion of a conventional planned career with its assumptions of linearity and progression. It is almost an ironic use of the term “career.” Yet while the stages of development in an un-career may be unpredictable they are nevertheless intentional. While learning still occurs in bursts these may be more intense, less aggregated, and not pre-planned. Rather than a career ladder there are a series of pivot points. This is different to a portfolio with its connotation of a patchwork of jobs or work assignments that present themselves. A pivot implies the making of clear career choices at critical junctures; again a sense of intentionality.

Un-careers are emergent. Emergence is a property of complex systems where all the states of the system cannot be predicted and where small changes in initial conditions can produce enormous differences in the outcomes. Un-careers are nonlinear and continually reshaped by new knowledge and deeper understandings. Another metaphor might be that of rapid prototyping your career; rather than having the fully detailed plans and then go into production you try things in settings of practice and thereby learn more about opportunities and possibilities which in turn reshapess your goals and methods of achieving these.

Un-careers are constructed reflexively. Reflexivity is an ongoing process of reflection before, after and during action, revolving around the reflecting self. Reflection is a tool in the continuous construction of reflexivity and reflexivity is a way of relating to the world and a basis for understanding and responding to experience. It is self-awareness about practice as it occurs, which allows the engineer to achieve more nuanced communication with other, because nothing is assumed. It allows them to work more effectively because they are constantly assessing how they are relating to the project and others in it and allows them to operate. Reflexivity has long been a part of anthropological analyses, since the anthropologist needs to be constantly taking account of how their own cultural presuppositions inform their perception and understanding of other people’s cultures (Jolly and Radcliffe, 2000).
Un-careers are inherently contingent in nature. They depend upon many individual, contextual and temporal factors whose impact cannot be easily predicted. Un-careers can only be “planned” in the sense the individual is engaged and sufficiently self-aware and reflexive that they can capture strategic opportunities at the intersection of life and work as these arise. Their trajectory may appear to be haphazard. For the external observer, what may seem to be a series of random steps at the time can make perfect sense when viewed together in retrospect.

Many of the strategies proposed by Hoffman and Casnocha (2012) for the “start-up of you” are applicable to creating an un-career. These include:

- Being Flexibly Persistent; having a rudimentary career plan but being very flexible in its development based on what happens.
- Applying ABZ planning; having Plan A (current best plan) and Plan B (similar to Plan A but a slightly different setting) and iterating on the plans regularly, with Plan Z being the lifeboat if all else fails.
- Prioritizing Learning; focused on “soft assets”, learning about yourself and the world.
- Learn by Doing or actions not plans.
- Making Reversible Small Bets.
- Thinking Two Steps Ahead.

One way to think about preparing for emergence, reflexivity and responsiveness to contingency is the concept of “intentional serendipity”. In the context of an empirical study of interdisciplinary researchers and scholars Allendoerfer et al. (2007) describe intentional serendipity in these terms:

“As although some of the described occurrences certainly have a serendipitous or coincidental quality, such coincidences were part of virtually every participant’s story, calling into question the reasons behind the prevalence of such luck. One way of interpreting this prevalence is what we call “intentional serendipity.” By this term we intend to highlight the way that critical events and connections are framed as happening merely by chance or luck, even though the scholars’ stories clearly show that they intentionally positioned themselves in certain ways or took actions that made it possible for these “lucky” things to occur. This intentionality took various forms, such as applying for certain jobs, introducing themselves to key people, attending certain conferences, or simply making a point of being open to new ideas from outside their home disciplines. We can develop habits of behavior and habits of thinking that increase the likelihood that you can find yourself in the right place at the right time”

Some Implications for Continuing Engineering Education

Conventional career planning is based on the assumption that the professionals, such as engineers, engage periodically in various forms of professional development activity, formally or informally, either on the job or via externally provided, usually credentialed, continuing educational programs. It is also assumed that these periodic bursts of CPD are initiated so as to move your career forward within a set of organizational or industrial norms. At its simplest this might mean gaining a new credential or undertaking a training requirement to be eligible for a
new assignment. A more strategic manifestation of this phenomenon could be an engineer undertaking a higher degree in order to be able to make either a significant change in the current career direction (perhaps within the existing organization or industry) or a career re-direction (perhaps from one industry sector to another or from a technical role to a more managerial role).

A shift to un-careers implies a fundamental change in the focus of continuing engineering education. It will have to move from a concentration on topical content creation and effective learner-centered delivery in the marketplace of knowledge consumers to one of mentoring, coaching individuals in the art of knowledge extraction and translation and reflexive career creation. The learning will be more in the context of work, more individual, more informal, more opportunistic and consequently less predictable either for the individual or in aggregate. The value proposition will be centered on how well a CEE provider can enable an individual engineer to better capture their critical learnings in the moment, be more insightful in the integration of these and their translation into future career episodes and agile in identifying and leveraging opportunities to pivot. The much vaunted life-long learning takes on new meaning and new forms in the context of an un-career.

In turn the shift to un-careers has profound implications for the undergraduate education of engineers. Learning how to learn, learning when to learn and learning what to learn become the pivotal competencies. It is about becoming a reflexive, aware, self-managed learner. The transformation from teacher-centric education to learner-centric education is a fundamental shift that is difficult to achieve. The move from learner-centric but teacher-led to learning becoming learner-led is equally challenging but even more transformative.

References


Jolly, L. and Radcliffe, D.F. (2000) Strategies for developing reflexive habits in students, ASEE Annual Conference & Exposition, St Louis, Session 1353, June, 2000,

