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Remaking the Service Class? Class Relations Among Software Developers in Ireland

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The Dilemma of the Middle Class

Professionals and experts have always posed a problem for companies as well as for class analysts. On the one hand, these workers are clearly wage labourers and employees and therefore share similar underlying antagonisms with their employers as less skilled workers. However, their particular skills give them a power in the workplace and in the labour market which distinguishes them from less skilled workers. This is the classic 'problem of the middle class' in class analysis. This ambiguous position is further complicated by the way in which professionals' market power creates connections between the expert worker class location and other class locations. While professionals and experts may be workers, they may also be capitalists, managers or in the petty bourgeoisie (Wright, 1989). This combination of class locations poses a particular problem for companies as they attempt to reconcile the multiple, overlapping and potentially contradictory interests of these experts with the goals and strategies of the firm itself.

Professional workers have been described, by Weberian and Marxist analysts, as members of a 'service class' who exchange not only effort for wages but a much more diffuse commitment to service to their employer for a more general and long-term prospect of compensation and career development. In the advanced capitalist economies in the post-war 'Golden Age' this 'service relation' was secured largely through the institutions of the hierarchical corporation, the internal labour market and the bureaucratic career (Goldthorpe, 1982, 2000). However, these very institutions have been significantly transformed in recent decades as 'delayering' of network organizations and decreased job security have weakened the bureaucratic career (Savage, 2000).

Crucially, even the most skilled of professional workers rarely *expect* to spend their careers with the same employer, even if they ultimately do so.

This paper investigates how the service relation between employer and professional worker is transformed under these conditions. In drawing on an ethnographic study of software developers in the Republic of Ireland during the 'Celtic Tiger' boom in 1997, the paper explores these trends in an industry, occupation and economic setting where they can be seen most clearly. The software industry in Ireland in the late 1990s was characterized by small firms with relatively few layers of management, rapid turnover of staff and little expectation of 'loyalty' or lifetime employment on the part of either employer or employee (Ó Riain, 2000, 2004).

I argue that the institutional changes in the regulation of class relations between professionals and employers has not undermined the service relation but has transformed it for certain employees[1]. 'Service' is still exchanged for the long-term prospect of 'compensation'. However, where the service relation of the 'Golden Age' rested firmly on long-term employee and employer expectations, these temporal horizons have been much shortened and even obscured. The reconciliation of the various class positions in which professionals find themselves (worker, self-employed petit bourgeois, owner of share capital) is less and less effectively carried out through the temporal structure of the career and is telescoped within the structure of work, increasingly organized around project teams. This creates significant instability in class relations among professionals and the coordination of professional class relations is increasingly carried out through spatial rather than temporal 'fixes' – at least partly explaining the increasing importance of regional economies relative to corporate

[1] The paper leaves aside the question of how widespread these transformations are and focuses instead on the dynamics of these reconfigured service relations.

hierarchicies. The high tech region becomes not only a 'milieu of innovation' but also a crucible of class relations and the re-negotiation of the terms of 'professional service'.

Service Class, Contradictory Class

In recent years we have seen an increasing dialogue and even convergence between Marxist and Weberian analyses of class, and particularly of the 'middle class'. John Goldthorpe argues, from a Weberian perspective, that expert workers are part of the 'service class' defined by a relationship to their employers which is very different than that applying to less-skilled employees (Goldthorpe, 1982). Goldthorpe argues that, while less skilled employees are bound to the firm by their labour contract, managers and experts are bound to the firm by a 'service relationship' where they are promised not only the immediate benefits of salary and so on but also the prospective benefits of a career. Among the workers likely to be involved in a service relationship are those with specialized knowledge and expertise (Goldthorpe, 1982; Erikson and Goldthorpe, 1993). Erikson and Goldthorpe argue that "A service relationship can thus be understood as the means through which an employing organization seeks to create and sustain such commitment; or , that is, a as a functional alternative to direct control in regard to those employees whom the organization must to some significant extent trust to make decisions and to carry them through in ways that are consistent with organizational values and goals" (1993:42).

Goldthorpe is adamant that class should be defined at the level of employment relations, so the distinction between service and wage employment relations is central to his very definition of the middle class. Erik Olin Wright's Marxist analysis, while using the notion of the 'service class', sees the service relation as a mode of regulation of class relations which are defined through the ownership of assets rather than through employment relations themselves (Wright, 1997: 25).

Wright (1997) argues that workers with high levels of skill and expertise, such as software developers, are in a privileged appropriation location within exploitation relations. This is because their skills are often scarce, giving them a strong position in the labour market, and their work is often difficult to monitor and control, giving them some control over their work situation. Wright's account here is very close to that of Weberians such as Goldthorpe[2].

However, Wright also points out in an earlier article (Wright, 1989) that such employees find themselves in an 'objectively ambiguous' class location because of (a) the multiple locations they may occupy at any one time and (b) the temporal structure of their careers. Wright (1989) argues that such professional and expert workers are linked in a variety of ways to managers, capitalists and the petty bourgeoisie (self-employed). Many professionals and experts occupy 'multiple locations' in the class structure - either through working in a second job (usually in a consulting or self-employed capacity) or through the ownership of capitalist property (usually in the form of stocks, shares and other investments). The higher wages of professionals and experts make them more likely to be able to sink money into capitalist investments so that "both in terms of interests in material welfare and in terms of interests in material power, professionals who accumulate significant savings and investments begin to share material interests with capitalists" (Wright , 1989: 333). Furthermore, the temporal trajectory of professionals and experts' careers links them to other positions in the class structure. Most professionals find their way into supervisory or managerial positions at some point in their careers , providing a powerful link to the interests of managers in that many professional jobs are "premanagerial" (Wright, 1989:334). Thirdly, Wright argues that many professionals have a

[2] Goldthorpe's most recent discussion of the service class grounds it more firmly within relations of monitoring and control in the workplace (Goldthorpe, 2000; Chapter 10). Despite Goldthorpe's grounding of his discussion in transaction costs analysis his explanation of why managers and professionals tend to find themselves in service relations is rooted in an analysis of production politics and ultimately furthers the convergence between Marxist and Weberian accounts.

petty bourgeois 'shadow class' location in that many professionals can take advantage of opportunities for self-employment as an alternative to working as employees under the control of capitalists and managers.

For both Wright and Goldthorpe, the temporal tranjectory of the 'career' is central to the service relation. Wright argues that "Such temporal trajectories ... generally place professionals and experts into contradictory class locations (the 'middle class') even if at a particular point in time they have not capitalized any of their income and are neither part of the managerial hierarchy itself nor self-employed. However, given the relatively underdetermined character of such trajectories for any given individual, professionals and experts may have, to a greater or lesser degree, what can be called objectively ambiguous class locations" (1989: 347). It is this ambiguity which is resolved in Goldthorpe's analysis by the formation of a service relationship between such professionals and experts and their employers. Goldthorpe, too, emphasizes the temporal element in the service relation which "envisages …. a quite diffuse exchange of service to the organization in return for compensation in which the prospective element is crucial; and, by the same token, the contract is understood as having a long-term rather than a short-term basis" (Goldthorpe, 2000: 220).

Transforming the Institutional Form of the Service Relation

However, in industries such as software, less hierarchical and more decentralized organizational structures, with the flatter internal hierarchies, weaker of internal labour markets and the reduction in the absolute number of management positions has challenged the traditional service relation. While in the Irish economy as a whole the ratio of managers to professionals and associate professionals is approximately 1:2.5, in software it is about 1:11 - indicating the relatively flat organizational structures in software and similar industries (Tansey, 1998: 41; software industry

survey[3]). The prevalence of job-hopping as a career strategy and the importance of local labour markets is reflected in the fact that a quarter of the firms in the software industry survey had employee turnover of 25% or more in 1996-1997 (software industry survey). Furthermore, the local labour market was almost as important a route into senior technical and management positions as internal labour markets in 1997 (software industry survey). But this more turbulent relationship has taken on a relatively clear institutional form - work organization based around project teams working to a deadline and careers increasingly relying on 'job hopping' within and between firms. The traditional career structure leading from expert into managerial positions has therefore become more problematic and the link between the engineer and the employer more ambiguous.

These trends mean that the corporate effort to secure expert employee commitment through building career and cultural attachment to the corporation have been heavily undermined with such 'corporate culture' models of commitment in the minority in areas such as Silicon Valley (Baron, Burton and Hannan, 1996). The dominant computer industry metaphor of IBM's promise of lifetime employment (which collapsed with a reduction of 140,000 in a workforce of 400,000 from 1986-93) has been replaced by the image of the freewheeling Silicon Valley engineers who expect little from their employers and will jump ship for more money or more challenging work at the drop of a hat.

The reality of mobility as a career pattern and the multiple class locations this involves is clear in the work histories of the members of a software team I worked on for 12 weeks in 1997. The team was part of the Dublin subsidiary of a Silicon Valley information technology company (that I call USTech) and was producing a software product under contract to a different US company. The

[3] A survey of 250 software firms undertaken in 1997. For further details see Appendix A in Ó Riain (2004).

team consisted of six people (including myself) during the time I was there. Séamus, the team leader, had been at USTech for 7 years. In that time he held four completely different positions - working as a computer test engineer, software systems test engineer, information systems support and software development team leader. The rest of the team had been assembled over the previous 6 to 18 months. Conor, 6 months out of college, still received job postings from his college career counseling service every two weeks. He left USTech 1-2 years later.

Jim and Paul were employed on a contract basis. Dan had also been a contractor and took almost a 50% pay cut to take up a permanent post in order to get a mortgage from the bank. Paul's history is one of a 'software cowboy', using a series of lucrative short-term contracts to see the world without being tied down by business, social or personal obligation. Jim and Dan have pursued a different path - they have at times been employees, contractors, entrepreneurs or a number of these statuses at the same time. They are almost stereotypical examples of Wright's multiple class locations among the middle class.

Mobility out of the firm is these software developers' key bargaining chip with their employers. One lunchtime Conor, myself and Michael, the group manager, ended up sitting together for lunch. We had somehow got onto the topic of the difficulty of getting people for the jobs that were available. Conor went into great detail on the job offers he had received on leaving college and on the ever-improving job market for graduates, until Michael quietly finished his lunch and left. Conor turned to me and asked "what did you make of that? I wanted him to know there are plenty of other jobs out there. What I didn't say is that I've been getting job offers every 2 weeks through the college".

The high mobility career pattern with little attachment to the employer (or to the employee for the firm) became a reality for these particular software developers in the 1990s - even in the apparently 'semi-peripheral' region of Ireland. The careers of such software developers converged significantly with those of their counterparts in the leading high-technology regions such as Silicon Valley or global cities such as New York and London (Saxenian, 1994; Girard and Stark, 2002). The limited structured internal labour markets in such 'flat organizations' institutionalize inter-firm mobility as employees can drive up their salary and get more interesting work by moving rather than staying within the firm.

Connections to co-workers were combined with a constant awareness that the members of the team might be dispersed at short notice. This can happen either by corporate decision (the team beside us was disbanded overnight when USTech in Silicon Valley halted development of the product on which they were working) or through the decision of individuals to leave the team. Mobility then is a double-edged sword - the advantage to employees of being able to leave with few repercussions is balanced against the lack of constraints on companies changing employees' responsibilities and even getting rid of them (within the bounds of the law). These advantages and dangers are even more significant for contractors who live and die by the double edged mobility sword (Kunda, Barley and Evans, 2002).

Although some companies try to build a strong 'corporate culture' in order to integrate these knowledge workers, there are severe limits to such a strategy (Kunda, 1993). For such skilled workers the high mobility pattern is seen as an advantage as they can avoid 'corporate bullshit' as much as possible. Indeed the ironic detachment from such corporate morale boosting strategies which was characteristic of information workers in large corporations such as Digital and IBM

(Kunda, 1993) has become an explicit part of the shared culture of the team, a culture which is toned down only for the most senior managers. The monthly glossy 'USTech Update' sent from the US and given to each employee was greeted with derision:

Conor: "it's rubbish, it's just brainwashing".

Jim: "At least it's not as bad as IBM. The scary thing is that some people believe this stuff"

This detachment was also expressed directly to managers:

Michael (the business manager): We'll pay you overtime for that. That's unusual cos you're here to fill a role, not just to do a set task, but we don't expect you to do the extra hours just for love of the country or the company...

Jim (ironically): Well, you know, Conor has been singing the company song all week....

Ultimately, these software developers found themselves navigating a line between autonomy and organizational politics:

Jim: I'm the product. It works out pretty well, I like the idea of trying to avoid organizational bullshit. But I always end up getting caught up in it. I end up staying long enough in each place that I get up to here in the politics, having to say the right thing to the right person at the right time.

The long term commitment to the service relation – and crucially Goldthorpe's crucial prospective element of the *expectation* of such a relationship – is substantially undermined.

Class Time: Reconciling Contradictions through Temporal Structures of Work

The institutional ground upon which the class interests of knowledge workers are reconciled within the workplace has therefore shifted and firms have tried to devise new sets of relations which can

bind the underlying class interests of the professionals/ experts to those of the company. This is achieved through the restructuring of the workplace around the autonomous project team. The mechanism for controlling the design project team is the project deadline. As the final requirements are usually somewhat vague and the actual work done by the team cannot be directly supervised by management, the deadline becomes the focus of management control and team efforts. "Do what needs to be done to get this specification working by the deadline" is the broad task of the team. The deadline is the mechanism by which management brings the intensification of time into the heart of the team (Ó Riain, 2000).

The team schedule had three main phases - a middle period of 'normal work', a hectic period before releasing the product at the deadline and a beginning period of rest and negotiation after the deadline and the release have passed. The class locations which are most salient change as the team members go through these stages of the cycle together. I join the team, as I did in my fieldwork, in the hectic pre-release phase and leave them as the post-release phase winds down.

The Pre-Deadline Phase: Managers, Autonomous Workers and the Control of Time

In the weeks before March 1st., the team's next major deadline, life in the team cubicle becomes busier and busier. The team works longer hours and becomes more and more isolated from the life of the company around them. Internally, the team becomes more cohesive, communication becomes more urgent, technical arguments take on an edge they didn't have before and any delay or instruction from outside is met with a barrage of criticism. As the deadline approaches the hours worked in the team begin to build, putting a great deal of stress on the increasingly dissatisfied software developers. Among the team members, proposed legislation limiting working hours is discussed ironically:

Séamus: I wonder does Ramesh [the team's US manager] know about the European Social Charter limiting the working week? 43 hours per week or something.

Conor: Great!

Jim: It's 48

Conor: Fuck, that long

Jim: Yeah, 48 for each company, 48 for Womble [the team's US contractor] and 48 for USTech!

However what appears to be deep antagonism to Ramesh during the pre-release stage fades away in the post-release phase. While the developers' complaints about management making their life more difficult persist their intensity wanes so that when Ramesh comes on a visit to Ireland after the release he is quite warmly welcomed (he is also personally well-liked by the team members).

Team members rarely put their complaints in the language of collective action. Despite the close ties between the team members and their generous cooperation and help given to one another, the solidarity of the team is cast almost entirely in negative terms. They need to protect themselves from the interference of management and less competent designers and developers in getting a technically good job done under reasonable conditions. This is achieved largely by controlling the flow of information out of the team as best they can. In many cases the reason for this screening of information was to avoid Ramesh's interference with a solution which the team considered to be the most technically effective. At other times, the goal was to avoid any extra tasks being given to the team before the deadline. On one occasion Ramesh sent an E-mail about a 'work around' the team would have to do around a problem in the database they were using. Not realizing that Dan had

been working on this issue for a while now, he set aside a day the week before the release for Dan to work on it.

Jim: Dan will have that done today.

Sean: So what about the day Ramesh is setting aside for it next week?

Jim: Oh God, I'm not going to tell him we already have a solution. He's already expecting it to slip a bit so if we get it in on time he'll be really happy. I think we're a little bit ahead of schedule but he thinks we're a bit behind so that suits us.

Nonetheless, this is the period when the software developers' 'worker' class location comes to the fore as they contest, at least to some extent, managerial control over time in the workplace. On the one hand the team solidarity and relative autonomy from managerial authority creates a satisfying work situation where they can work autonomously on the technical issues which interest them and where there is relatively open participation in technical decision-making. The team is largely self-managing and when Seamus is in the U.S. for a week or two Jim, a contractor, becomes the team leader. The participatory work process therefore tends to blend managerial and expert worker locations within work itself. The polarization between managers and workers is clearest however in the dissatisfaction of the Womble team members about the intensification of time and the pressures imposed by the deadline create the conditions which lead to burnout - manifested in the exhaustion of the team members up to and after the deadline and also in the decision made by Ramesh some 5 months after I left the team to resign due to over-work. While manager - worker class locations are blurred in the work process they become increasingly polarized in the silent war over working hours and the control of time.

The Post-Deadline Phase: Petty Bourgeois Mobility and Captured Capitalists

After the deadline is met the team goes into temporary collapse with the work pace slowing dramatically. As work starts to pick up again, I notice that the solidarity of the team in the pre-deadline phase has fractured. During the period after the release individual team members begin to negotiate their roles in the next phase of product development. The team begins to fragment as the focus of the team shifts from getting the work done to building a career and as the team members look outwards to their future opportunities within and beyond the team.

The next deadline is 3 to 4 months away and requires the implementation of the system in the Java programming language. From the team members' point of view this is a great opportunity - training in Java and experience in developing a complex product in the language will be a huge resource for them in the labour market. However, the distribution of opportunities for training and for valuable experience is not determined by the technical requirements of the product. It is an object of negotiation within the team, negotiation which takes place through the social networks among team members and between team members and the team leader and managers. The issue is rarely mentioned publicly, let alone discussed collectively. Furthermore, the move to Java is a gradual one and each stage produces different sets of conflicts.

There are many ways to incorporate new skills and sources of knowledge into the team. Training current employees is always an option but is often overlooked in the hectic development schedule. No one can be let go to a week long course with the deadline hanging over the team. The team also missed out on other training opportunities while I was there due to this pressure of time. There is also always the temptation for the company to hire a contractor with expertise in the area rather than providing training. This is a particular danger for permanent staff because, while contractors may

only come for a short while, they often stay longer as they develop a knowledge of a particular piece of the product or become valuable to the team in a particular area. Even I, as a novice technical writer, become valuable in that having developed a knowledge of the product I would be able to write the help for future editions more quickly than some professional 'tech writers' with no knowledge of the product. There is a clear tension between the desire of the company to build up experience with the firm's products among employees and the efforts of the software developers themselves to avoid reliance on such firm-specific human capital and to build up the skills which they can translate into rewards on the open labour market. This once again reflects the restructuring of the service relation between professionals and their employers and the challenge to companies of coordinating professional interests with firm strategies.

It is in the internal competition for Java work that the fragmentation of team solidarity is clearest. On Ramesh's second visit he treated the whole team to a dinner and a night out on the town. Each one of us, as we sat over dinner and wound our way through the city streets, discussed our future roles with Ramesh - I myself talked over the possibility of doing some further technical writing on a contract basis once my fieldwork was over, Paul discussed his hopes to do some field consulting on the product, Jim and Paul their plans to work on a new technical area of the product, Conor his desire to do work with Java in a particular application of WebLearn. Indeed we also put in a good word with Ramesh for each other where the different roles seemed complementary. In competition over certain areas, the team members helped each other out in others.

The mobility of team members through various learning paths within the team and outside of it is negotiated in this phase, laying the foundation for the next pre-release phase in three to four months time. This is clearly a volatile and risky time - ultimately some of this development work was brought

back to Silicon Valley. Some months after I left the team Jim and Paul, the two contractors, went on to positions elsewhere in the global industry when their contracts were not renewed.

In the post-release phase, as the software developers focus on their careers their petty bourgeois 'shadow class' and their ability to turn their skills into capital are thrown into sharp relief. When Jim described himself as 'the product' (see above) he was referring to the self-employed status of himself and Paul but this also has relevance for the permanent employees who are close to being self-employed given their strong dependence on the external labour market in building their careers. Companies are increasingly trying to cope with this mobility and the emergence of the petty bourgeois class location from the shadows by offering employees stock options - trying to combat the mobile petty bourgeois tendencies by creating 'captured capitalists' whose realization of their material interests as capitalists are dependent on staying with the company for some time. Because USTech Ireland is a subsidiary of a transnational corporation and the team are working under contract for a separate US firm, stock options are not widely used.

Where the tensions and contradictions between the multiple class locations of middle class professionals had once been organized though the temporal structure of the career they are now managed through the temporal structure of work as software developers move between their pre-deadline experiences as workers and their petit-bourgeois post-deadline experiences. Companies feel increasingly threatened by the replacement of commitment to the firm generated through a 'service relation' with a broad commitment to a 'technical community' which extends beyond the firm and may not even be strongly organized by professional bodies. This shift results in a change in the way in which experts' contradictory class locations are reconciled - for the service class this was achieved through the temporal structure of careers, for technical communities it is achieved through the

temporal structure of work itself. In the pre-deadline phase of the project team the team members are focussed on the work itself and are largely self-managing, blending something of the manager and worker locations in a single work situation. However, at the same time, the polarization between their interests as 'workers' and the interests of the company comes to the fore in the contestation over the pressures of the deadline and the control over time. It is as this stage of the work process that the language of resistance and collective action emerges within the team, although in a very tentative way.

After the deadline, the worker class location seems to disappear as the 'petty bourgeois' 'shadow class' of these expert workers becomes more salient as they pursue a career strategy based on their location as an independent agent in the market. Companies attempt to capture these workers back into the orbit of the company by offering stock options or increased pay which can later be turned into investments - experts are asked to choose between the vagaries of life as independent small businesses (with themselves as the 'business') and the commitments of becoming 'captured capitalists' within the firm, tied in by 'golden handcuffs' such as stock options (Kunda, Barley and Evans, 2002).

Reconstituting the Service Relation: From Time to Space

Time becomes an ever more pressing reality in the deadline-driven workplace even as it becomes a less stable structuring force in reconciling class relations. Certain characteristic organizational problems are likely to emerge. The intensification of time and the pressures imposed by the deadline create the conditions which lead to employee burnout - manifested in the exhaustion of the team members up to and after the deadline and also in the decision made by the senior manager of the project (some 5 months after I left the team) to resign due to over-work. The pressure and

introverted character of the pre-deadline phase, and the resulting insulation of such workers and the organization of work from any kind of broader social accountability, make it all the more difficult to reconcile the team structure and culture with broader social concerns. This is most obvious is the work-family nexus where work demands come to dominate family life, leaving very little space for workers to negotiate alternative work and family time arrangements.

The post-deadline phase of high mobility creates a great deal of volatility and insecurity in the labour market so that employees lack strong employment guarantees. Even in the current tight labour market of the late 90s, 'employment security' gives way to 'employability security'. However, when career gains are based on the threat of mobility this seems to inevitably lead to increased labour market inequality as the threat to leave is only effective when replacing the employee is difficult. As it is inherently based on scarcity, the limits of mobility as a universal career strategy are clear. These new workplace institutions have created pressures for longer hours and for more individualised bargaining over pay and other financial benefits, contributing to the dominant social problems which have emerged in Ireland of rising inequality and increased pressure on the social reproduction of labour (childcare, housing, transport etc).

In this context the region becomes a critical space where many of these problems become evident as firms reduce the security they offer employees and externalize the costs of social reproduction as much as possible. As internal labour markets become less reliable as the basis of careers, networks outside the firm become critical. Careers are built using mobility between firms to bargain for improved wages and access to technical learning and these mobile careers only increase the importance of close interactions and strong local cooperation while working on any particular project. The emergence of 'the region' as a critical space for innovation also facilitates mobility as

employees find it relatively easy to 'job-hop' within the region and others migrate to the region, attracted by the concentration of high technology jobs (Scott, 1993; Saxenian, 1994).

'Service', even in the face of the pressures of the deadline, is secured through the threat of the destruction of a worker's reputation in the local labour market. The CV itself can be read for signs of such unreliability – the team members pored over the CVs of candidates for the position of contract developer within the team, looking for the tell tale signs of such unreliability including a series of very short-term contracts and evidence of having left a project before it was completed. Vast amounts of information flow more directly however – Conor destroyed the chances of one candidate he knew from college, by declaring that "he's a bit weird. He wouldn't talk to anyone, that kind of guy. He used to scare me actually!". The team members maintained contact with their own networks within the industry – at times contacting friends for technical advice and regularly sending bad jokes around email lists of friends. The short-term contract staff who flitted in and out of the team put a significant amount of work into maintaining their networks, constantly talking on their mobile phones about technology, upcoming jobs and people in the industry. For all the team members, but particularly for the contractors, social networks replaced many of the functions of the firm in the service relation (Nardi, Whitaker and Schwartz, 2000).

But if social networks were a resource, they were also the conduit through which reputation was maintained – and reputation in networks is increasingly the mechanism that secures 'service' to capital, even when service to the employer is undermined. Participation in the local and transnational networks of the 'technical community' is crucial for careers and becomes a new contested terrain of the informational workplace. As professional class relations are reconciled within the temporal structure of work, many of the dilemmas of contradictory class relations are externalized, only to

show up as problems of insecurity and underinvestment in the region. As market mechanisms fragment the firm, the technical community, the region and ultimately the state are drawn ever more into resolving the problems of capital – and occasionally even those of workers - in the new service relation.

References

Baron, J., M. D. Burton and M. Hannan (1996) 'The road taken: origins and early evolution of employment systems in emerging companies' *Industrial and Corporate Change* 5, 2, 239-275.

Erikson,R. and J.H. Goldthorpe (1993) *The Constant Flux: A Study of Class Mobility in Industrial Societies* Clarendon Press, Oxford

Girard, M. and D. Stark (2002) "Distributing intelligence and organizing diversity in new-media projects." *Environment and Planning A* Vol 34, pp. 1927-49.

Goldthorpe, J.H. (1982) "On the Service Class: Its Formation and Future" in A.Giddens and G.Mackenzie (eds.) *Social Class and the Division of Labour* Cambridge University Press, Cambridge

Goldthorpe, J.H. (2000) *On Sociology* Oxford: Oxford University Press

Kunda,G. (1993) *Engineering Culture* Temple University Press, Philadelphia.

Kunda, G., Barley, S.R., & Evans, J. (2002). "Why Do Contractors contract? The Experience of Highly Skilled Technical Professionals in a Contingent Labor Market" *Industrial & Labor Relations Review* 55(2): 234-261.

Nardi, B., S. Whittaker and H. Schwarz (2000) "It's Not What You Know, It's Who You Know: Work in the Information Age" *First Monday* 5, 5

Ó Riain, S. (2000). "Net-Working for a Living: Irish Software Developers in the Global Workplace" pp. 175-202 in M.Burawoy et al. *Global Ethnography* Berkeley: University of California Press

Ó Riain, S. (2004) *The Politics of High Tech Growth: Developmental Network States in the Global Economy* Cambridge: Cambridge University Press

Savage, M. (2000) *Class Analysis and Social Transformation* Buckingham: Open University Press

Saxenian, A. (1994) *Regional Advantage* Harvard University Press, Cambridge.

Scott, A. (1993) *Technopolis* University of California Press, Berkeley.

Wright, E.O. (1989) "Rethinking, Once Again, the Concept of Class Structure" in E.O. Wright et al. *The Debate on Classes* Verso, London.

Wright, E.O. (1997) *Class Counts* Cambridge University Press, Cambridge.